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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 43.

A MONOGRAPH OF THE BATS OF NORTH AMERICA.

BY

HARRISON ALLEN, M. D.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

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ADVERTISEMENT.

This work (Bulletin No. 43) is one of a series of papers intended to illustrate the collections belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consist of two series—the Bulletin, of which this is No. 43, in continuous series, and the Proceedings, of which the sixteenth volume is now in press. A small edition of each paper in the Proceedings is distributed in pamphlet form to specialists in advance of the publication of the bound volume.

The Bulletin of the National Museum, the publication of which was commenced in 1875, consists of elaborate papers based upon the collections of the Museum reports of expeditions, etc., while the Proceedings facilitate the prompt publication of freshly-acquired facts relating to biology, anthropology, and geology, descriptions of restricted groups of animals and plants, the discussion of particular questions relative to the synonymy of species, and the diaries of minor expeditions.

Other papers of more general popular interest are printed in the Appendix to the Annual Report.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletin of the National Museum are referred to the Committee on Publications, composed as follows: T. H. Bean (chairman), A. Howard Clark, R. E. Earll, Otis T. Mason, Leonhard Stejneger, Frederick W. True, and Lester F. Ward.

S. P. LANGLEY,
Secretary of the Smithsonian Institution.

WASHINGTON, D. C., *September 20th, 1893.*

SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

MONOGRAPH OF THE BATS OF NORTH AMERICA.

BY

HARRISON ALLEN, M. D.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

PREFACE.

Nearly thirty years have passed since the Monograph of the North American Bats* appeared as one of the series of miscellaneous publications of the Smithsonian Institution. Imperfect as it was, this memoir has remained the single work on the subject. The influence of Prof. S. F. Baird is discernible throughout, and it is proper to say that the opinions of species therein entertained were accepted by him. But the changes in systematic zoölogy make it desirable that a new essay be written.

The monograph as it now appears is essentially new. It is not only larger by reason of the addition of species, but the descriptions are elaborated. Novel standards of comparison have been employed and many anatomical details included in the introduction.

The region occupied by the monograph (as in the original issue) is that of North America, extended to the south as far as the boundary line between the United States and Mexico.

Since 1864 two forms (*Euderma maculata* and *Atalapha teliotis*) have been discovered. Two tropical genera (*Artibeus* and *Promops*) and one species (*Vespertilio albescens*) have been found to extend their northern movements so as to be included in the United States. The chief accessions have come in the form of geographical subspecies. Among these occur *Promops perotis californicus*, *Nyctinomus macrotis nevadensis*, *Vespertilio albescens melanorhinus*, *Vespertilio albescens affinis*, *Vespertilio albescens evotis*, *Vespertilio nitidus ciliolabrum*, *Vespertilio nitidus macropus*, and *Vespertilio nitidus longicrus*.

In the accounts of the genera *Vespertilio* and *Nyctinomus*, which we know to range southward over extended areas, the work is confessedly incomplete, since the material available did not permit of comprehensive study. I felt indisposed to treat critically the descriptions of authors of forms, which, in my judgment, demanded careful comparisons of types and of extensive series of individuals. I can not pass judgment therefore upon the validity of the new species of *Nyctinomus* described by Dr. C. Hart Merriam (*Nyctinomus femorosaccus* and *Nyctinomus moharensis*), nor of several new species of *Vespertilio* from Mexico which have been described by other authors.

---

*A Monograph of the Bats of North America. H. Allen, M. D., assistant surgeon U. S. Army, Washington, D. C., 1864.

The material used in revising the old monograph and bringing it up to date is for the most part that in the possession of the U. S. National Museum. Valuable aid was received by specimens examined from the collection of the Museum of Comparative Zoölogy of Harvard University; that of the American Museum of Natural History, New York; that of the Academy of Natural Sciences of Philadelphia; and that of the California Academy of Science. I desire to return my thanks to the officers of these institutions for courtesies extended. Dr. C. Hart Merriam, of the Agricultural Department, Washington, kindly sent me the entire valuable collection of the *Vespertilio* in his charge; and by so doing enabled me to study this difficult genus under the most favorable circumstances. Special acknowledgments are also due Mr. H. A. Ward, of Rochester, N. Y., who placed in my hands his entire collection of Chiroptera. I also wish to thank Mr. G. S. Miller, jr., of Cambridge, Mass.; Prof. J. H. Montgomery, of Meadville, Pa., and Dr. Robert W. Haynes, of Los Angeles, Cal., for valuable assistance.

All measurements are assumed to be in the French scale unless otherwise stated.

The measurements in English scale are taken from the monograph of 1864, together with lists of specimens which at that time formed the basis of the descriptions. These are copied for the convenience of readers who may not have access to that publication.

The figures have been drawn by Mr. F. von Iterson with a fidelity to the originals which can not fail to aid the student of a confessedly-difficult group of animals.

ABBREVIATIONS.

U. S. N. M.—United States National Museum.
A. N. S. P.—Academy of Natural Sciences of Philadelphia.
M. C. Z.—Museum of Comparative Zoölogy.

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A MONOGRAPH OF THE BATS OF NORTH AMERICA.

BY HARRISON ALLEN, M. D.

INTRODUCTION.

The bats constitute the order Chiroptera. Unlike related groups which are equally extensive, the bats do not vary in sufficient degree to be confounded by any possibility with other creatures. By an untrained observer shrews might be mistaken for mice or voles, some of the smaller marsupials for minks or weasels, conies for marmots. But the popular impression of a bat is accurate, since this creature is the only mammal adapted for true flight, and no other mammal resembles it. If any mammals exist or have existed that are half bats and half moles, half bats and half lemurs, half bats and half marmots, they are quite unknown to the naturalist. Paleontology is silent as to the origin of the bats, though comparison of their bony framework with those of the Insectivora, Lemuroidea, and Rodentia suggest that they may have arisen from the mammalian stem not far from the points at which the differentiation of these branches began.

MEMBRANES.

Let us examine the undissected bat, and endeavor to establish thereby general conceptions of the creature and of some of the signs of the superficies by which its varieties can be named. It is at once seen that the anterior extremities are furnished with greatly elongated fingers, the intervals between which are occupied by two layers of skin. Goldsmith uses a happy phrase when he says "the fingers serve like masts that keep the canvas of a sail spread and regulate its motions." Layers of skin thus make up the wing membrane. They are continuous from the last finger and the thumb, or some adjacent surface, to the sides of the body, the neck (both above and below the arm and forearm), and the outer side of the posterior extremity. Each wing membrane reaches below the knee and from this point, in varying degrees, to the ankle and the foot. The space between the posterior extremities is also occupied, as a rule, by two adjoined layers of integument which constitutes the interfemoral membrane. This structure as opposed to the above is less constant in form and dimensions. It may be guided by a long tail quite to its tip, it may allow the tip to project in different degrees beyond its free margin, it may greatly exceed in size that of the stunted tail, it may be defined as a hem along the inner border of the limbs, or it may be entirely absent.

It follows from these statements that all bats are provided with a back and a front skin-expanse from the sides of the body to the extremities in a constant manner, but from the tail to the posterior extremities in an inconstant manner, the last named presenting modifications determined by degrees of outgrowth of the tail itself.

The membranes present many details with respect to the manner of their attachment to the sides of the body and to the various parts of the limbs. Interesting variations of plan are seen where the skin crosses joints. In the elbow joint the skin may be attached entirely to the epicondyle, so that the joint lies quite to the under side of the wing, as in the African fox-bat, *Epomophorus;* or it may be attached midway, namely, to the olecranon, as in many forms, but perhaps best seen in the neotropical American *Saccopteryx;* or it may be attached entirely to the epitrochlea, so that the joint lies quite on the upper surface of the wing, as in *Rhinolophus pearsoni* and *Taphozous.* At the wrist distinctions are seen in the manner in which the tendons of the extensor carpi ulnaris and flexor carpi ulnaris are disposed at the angle which is formed between the radius and the fifth metacarpal bone. When this angle is marked, and skin-folds are conspicuous over the tendons named, a radio-metacarpal pouch is defined. The knee always lies on the upper surface of the membrane. It is most free in *Macrotus* and least so in the Molossi.* The membrane attached to the ankle may lie entirely to the hallucal side of the joint, but is disposed to cross it by an oblique raised fold and be secured to the minimal, *i. e.*, little toe side.

I have found it convenient to employ a number of names for the subdivisions of the dermal expanse.

The membrane which extends from the sides of the trunk to include the anterior extremity is the wing membrane ("bat wing," patagium).

The membrane between the legs is the interfemoral membrane (uropatagium).

The wing membrane above the arm and forearm is the prebrachium (antebrachial membrane, propatagium).

The wing membrane below the arm and forearm would become antithetically the postbrachium. But since the postbrachium could not be separated from the sides of the trunk and the legs, it has been found necessary to discard it.

The part of the wing membrane lying between the body, the humerus, the lower extremity, and a hypothetical line drawn downward from the elbow and intersecting the free margin of the membrane, is the endopatagium.

---

* The group named the Molossi will be held in this essay to be distinct from the group of which *Emballonura* is the central genus. I am of the opinion that these alliances are distinct and coequal.

The boundary at the elbow is often fixed by the vertical terminal branch of the triceps fascide system. The subordinate lines (probably platysmal in origin) in the endopatagium incline obliquely either toward the humerus or the trunk.

The part of the wing membrane which is limited by the line at the elbow as above given, by the forearm, and the fifth metacarpal bone and phalanges, is the mesopatagium.* Within the mesopatagium the subordinate lines incline either toward the forearm or the manus.

The part of the wing membrane limited to the manus becomes the ectopatagium (dactylo-patagium). The subdivisions of the ectopatagium are the first, second, third, and fourth interspaces. These are named from the pollex toward the quintus. The series of bones which is embraced in the metacarpal and phalangeal lines being conspicuous in the bat, it is desirable to possess a name in referring to each series taken as a whole. The name digit will be used for the rod of segments embracing the metacarpal element. The nerve which appears at the anterior margin of a digit becomes predigital, and that of the posterior margin, postdigital.

The cartilaginous tip to the terminal bony phalanx, respectively, of the third, fourth, and fifth fingers might receive the name of the third phalanx when three phalanges are present, and of the fourth phalanx when four phalanges are present.† The shapes of the terminal phalanges are of interest and some of these will be described.

I have examined a sufficient number of genera to suggest that an account of the markings of the wing membranes and of the shapes of the terminal phalanges enter into all discriminating studies.

The division of the wing membrane into the parts endopatagium, mesopatagium and ectopatagium is sustained by what is observed in *Taphozous mauritianus*, since in this species the endopatagium is of a dark color while the rest of the membrane is white, excepting the extreme tip of the end of the third finger. Now when the animal is at rest the surfaces above named are those only which are exposed to the light. In all young bats which cling to the mother, without exposing any other portions of the membrane than those named, it is evident that for a long period the endopatagium has functions which are not exacted of the rest of the wing membrane, and in consequence, in my judgment, it is easy to see how this portion of the wing expanse should be distinguished from those portions which are used only in flight.

---

*The endopatagium and mesopatagium are together the same as plagiopatagium of Kolenati. (Beitr. z. Naturgesch. der Europ. Chir., Dresden, 1857.)

†It must be acknowledged that the study of the embryos does not confirm the statement here made. In a word, the segmentation of the cartilage from the shaft of the bony phalanx remains a probability only.

The digits on their palmar aspect may be sharply defined as in the Phyllostomidæ and *Corynorhinus*, or they may be obscured by the membrane or the upper part in the forepart of the hand, namely, in the region of the second, third, and fourth digits, as in Molossi, Vespertilionidæ and the genus *Antrozous*. The membrane may lie chiefly on the upper aspect of the digits, as in most bats, or at the lower. That in the second interspace may be attached to the upper border of the second and to the lower border of the third metacarpal bone.

The skin is much more loose about the legs than the arms and on the interfemoral membrane than the wing membrane. The membranes are attached to the lower border of the first two or three caudal vertebræ, thus permitting them to be seen distinctly *above*, and to the upper borders of the remaining vertebræ, thus permitting them to be seen more distinctly *below*.

The skin of the two sides of the body unite in such wise as to permit a very narrow interval to exist between the two layers. The upper layer of the wing membrane is extending directly outward on a level with the back of the chest and of the loin, but the lower layer is variable. It may extend outward as in the upper layer, but a disposition exists for it first to conform to the curve of the side of the trunk and join the upper layer near the union of the side with the upper surface of the trunk. In one remarkable instance, *Chilonycteris daryi*, the under layer extends quite to the middle line of the back, and thence is deflected in an acute angle outward to join the upper layer. The region of the axilla is greatly depressed in bats, owing to the inclination for the under skin layer to extend upward and backward. This space is so large as to suggest the adaptation of the pouch thus formed for the protection of the young. In *Cheiromeles* it must have another significance, since it here constitutes a huge bag-like involution which extends as far as the middle line of the back.

THE WING MEMBRANE AT REST.

The bat when at rest folds the fingers by a movement of the root of the hand (carpus) downward on the wrist end (distal end) of the forearm. This movement is characteristic and when completed brings the fingers (in a compact bundle like the ribs of a closed umbrella) under the forearm and parallel to it. The hand is thus tucked up toward the rest of the anterior extremity, and as the forearm (in the same movement) is sharply flexed on the arm the entire extremity presents the greatest possible contrast to what it exhibited when prepared for flight. The bat now supports the body in one of two ways. It is prone, *i. e.*, with the front of the body downward on the plane of support, or it is pendant, i. e., hung by the claws of the hind feet. If it is prone the base of the thumb and wrist supports the body and is furnished with a hardened pad of skin (callosity) for the purpose, the thumb being held at same time well out of the way, and the posterior extremity taking the position nearly the same as that of terrestrial quadrupeds. The best example of those that scurry* when the wings are folded are the Molossi. In this group the phalanges of the third and fourth digits are now no longer held in axial line with the metacarpals as in flight, but are drawn upward and to the side, though well out of the way. The tail in all prone forms remains extended and the tip touches the plane on which the animal rests. If the bat is pendant in rest the base of the thumb and wrist do not support. The thumb is without callosity, is more engaged in the wing membrane, and is drawn more or less in toward the under surface of the wing. In this event the foot is furnished with sharper and more recurved claws, since they are now prehensile. The leg assumes a position quite at variance with the terrestrial position and is different in this regard from all mammals, the sloth alone excepted. The tail in the pendant form, at least in our red bat, is drawn well forward and rests on the lower part of the trunk. It is readily seen that very long digits of the anterior extremity would be more or less in the way in the prone forms, while they might be extended to any degree in the pendant forms, without interference. In fact the first named have smaller digital elements than the last and the wing expanse is correspondingly more restricted.†

THE WING MEMBRANE IN FLIGHT.

While interesting characters are thus observed in the bat when at rest it is in the use of the limbs in flight that the chief peculiarities are noted. The intervals between the digits vary greatly in the different genera. As already remarked the under surfaces of the second and third digits are boldly outlined or are covered with membrane so as to obscure their outlines. In the forms in which this obscuring is noticed the fifth finger is supported by a little rod of cartilage.

The opening of the wing exerts a powerful influence over the posterior extremity. It pulls it outward in the forms in which an interfemoral membrane is present and thus makes tense this membrane. The entire limb is abducted from the terrestrial position and the foot is turned with its plantar surface forward.

The wing membrane may be said to be redundant when the expanse above the arm and forearm extends freely to the carpus and embraces the small thumb to a point beyond the first phalanx of the thumb; when it extends down to the foot beyond an oblique muscle line which extends upward and outward from the lower part of the leg; when the space between the second and third digits is ample, and that between the thumb and second digit is provided with a well-defined hem of membrane.

---

*A word was needed to express the terrestrial motion of a bat whose wings are at rest. I venture to use "scurry" in lieu of a better.

†The contrast between prone and pendant positions of bats when at rest is an instructive one. It supposes the existence of a number of adaptive characters, which will be observed in the accounts of members of our fauna. So little is known of the habits of bats that it would be premature to base any generalizations upon these or any other isolated groups of structural peculiarities. I have seen our common brown bat in captivity hang itself up by the claws, but have never seen it other than prone when at rest in its native haunts. I am also aware that *Rhynchonycteris* (which has a flexed thumb and a small pollical callosity) comes to rest like a moth; *i. e.*, with wings expanded yet prone.

Skin folds are often disposed along the lines represented by the palmar fascia, at the proximal end of the fifth digit.[*] The flexor tendons at the radio-digital angle are often covered with similar dispositions of the skin.

The membranes are supported not only by the parts of the skeletal frame-work, as these parts are usually defined, but by a number of special adaptations. An accessory cartilage at the somad margin of the terminal fifth digit has been already named (Vespertilionidæ, except Plecotus).[†] The interfemoral membrane is supported at the free margin by a special cartilage (calcar) from the tarsus in all bats excepting the Pteropidæ, Rhinolophidæ, and the stenodermata. The calcar may have a process from its under margin, as in *Noctulinia noctula*. The terminal joint of the tail may be spatulate, as in *Nycteris*. Terminal cartilages of the third and fourth digits are present except in Pteropidæ, Rhinolophidæ, and Emballonuridæ. They are of varying shapes, the whole arrangement having for its object the support of the free margin of the wing membrane. These cartilages, as a rule, are deflected outward, though they may remain axial, as in Phyllostomidæ and Plecoti.

All things remaining the same, the degree of strain may be measured by the extent and variety of these special supports, and may be said to be in the line of specialization for aerial movements. Hence, in forms in which they are absent the membranes are broad and may be said to exhibit more of a parachute arrangement than in other types in which they are present, and the motion of the wings to be like that of a slow hovering rather than a rapid, varied flight.

Strain on the membranes is also shown in the angles formed between the [illegible] of the wing farthest away from the body, namely, the region of the second and third digits. These are pulled away from the [illegible] and [illegible] digits, which remain nearly passive, by the traction of the muscles which extend these bones [illegible] and the whole membrane becomes tense. The contrast between the shapes of the wing in this regard is considerable when such forms as [illegible] are compared.

When the wing of a bat is held [illegible] between the [illegible] the observer and a bright light the membrane is seen to be translucent. The delicate connective tissue lines (trabeculæ) are seen uniting the various parts of the bony framework, and the positions of the nerves, blood vessels, and muscle-fascicles are displayed. The paths of the nerves and blood vessels constitute one system and may be spoken of together, but the trabeculæ and muscles are distinct from these and in some degree from each other. As in the case of the relation which exists between the skin and the bones, so in the arrangement of the parts just named the degrees of strain to which the wing is subjected account in the main for the difference in the various genera. The muscle-fascicles are most numerous in the membrane near the body, and are better developed in the narrow-pointed winged forms, such as Molossi and *Atalapha*, than in the broad, parachute-like forms.* The muscle element in the wing is especially weak in the Pteropidæ, Rhinolophidæ and Vespertilionidæ.

---

[*] [illegible] and Molossus.

[†] [illegible] S. Nat. Mus. [illegible] 1880: [illegible] Molossus, while said to be absent in [illegible] both of these statements. The first announcement respecting the accessory cartilage was made in Proc. Acad. Nat. Sci. Phila., 1880, [illegible].

The fibrous lines which extend across the membranes are not without system. Many of them are excessively attenuated tendons; such, for example, are the fibers of the palmar fascia, already mentioned. Others are the fibers which connect the joints of digits; more of them yet appear to be parts of a true derm. The nerves and blood vessels pursue the same courses. Since the directions of nerves are of more importance in morphological study than the vessels, the former will be alone named. In each interdigital space a nerve tends to enter at its proximal end and, dividing into two branches, incline along the sides of the opposed metacarpal bones. The departures from this plan are numerous, and are so constant in groups of generic and even specific limitation that they constitute valuable additions to diagnoses.

An oblique raised line passing down on the wing membrane from the upper part of the arm, in most bats, corresponds to the *coraco-brachialis fascicle.* It is least marked in highly aberrant forms, and may be of nerve origin, instead of muscular, in *Noctilio*, *Corynorhinus*, and *Plecotus*. A second, lying near the elbow, in like manner, is caused by a muscular slip from the triceps extensor and therefore becomes the *triceps fascicle.* In *Corynorhinus* and *Plecotus* this line is represented by one corresponding to a nerve, apparently ulnar, or the internal cutaneous. Both these lines are offshoots from the muscles named. The *intercostal lines* are those which pass directly from the sides of the trunk.

The wing membrane, when expanded, exhibits differences in the width of the interdigital spaces. These differences relate in an intimate manner with the behavior of the parts in flight, and consequently with habit. The subjoined table indicates some of these distinctions:

---

* Perhaps the highest degree of development of the muscle system is attained in *Rhinopoma*.

Manal (pteral) formulæ of the widths of second, third, and fourth interspaces.

Species.	II.	III.	IV.	Fore-arm.	Difference between III and IV.
	mm.	*mm.*	*mm.*	*mm.*	*mm.*
Lophostoma	7	17	18	49	1
Schizostoma	3	16	21	32	5
Macrotus	2	15	22	44	7
Desmodus	2	21	37	53	10
Vampyrops	3	17	27	36	10
Chilonycteris	1½	15	17	40	12
Hemiderma	5	20	32	26	9–12
Vampyrus	16	41	53	105	12
Lonchoglossa	3	19	32	33	12
Monophyllus	3	17	34	32	14
Artibeus	4	21	39	51	18
Brachyphylla	3	25	43	64	18
Mormops	3	16	35	50	19
Phyllostoma	4	29	62	81	45
Rhynchonycteris	5	16	25	40	9
Cynopterus *	10	18	27	58	9
Vespertilio †	2	11	31	59	10
Epomophorus ‡	13	21	39	83	11
Rhinopoma	3	13	30	64	17
Molossus §	½	5	35	46	30
Noctilio	2	13	58	83	45
Pteropus ‖	18	17	69	145	52

* C. marginatus.
† V. murinus.
‡ E. franqueti.
§ M. rufus.
‖ P. edwardsii.

This list is selected in the main for comparison in members of a single family, viz, the Phyllostomidæ. The last eight forms are from families other than the one first named.

It is believed that these distinctions may be conveniently included in the characteristic proportions of bats.

In flight the thumb is extended in Vespertilionidæ, but partially flexed in Phyllostomidæ (excepting *Desmodus* and *Diphylla*) and in *Plecoti*. The degree of inclosure of the thumb in the membrane answers to the amplitude of the membranes generally and when extensive tends to draw the thumb slightly toward the palm, the space between the thumb and index finger being moderately occupied by a skin expansion.

It is a tendency under certain conditions for all growth processes to dominate functions other than those which are essential to their own activities. The best general conception of the manner of extending a fold of skin between the limbs is seen in the Batrachia. In the water newts a longitudinal ridge is often seen extending along the sides of the trunk. This is continuous along the hinder border of the anterior extremity (well developed in *Menopoma*) and reaches as far as the tip of the fifth digit. This fold is supplied by the ulnar nerve, which appears to be in its earliest expression a nerve for the skin of the posterior border of the forearm, of the fifth digit, and the muscles found in these regions. The phenomena of a fold of skin extending between the toes is one already familiar, so that the general plan of the skin expanse in a creature so low as the *Menopoma* prefigures that of so highly specialized a form as the bat without violence and without leaving a single line obscured. Difference of degree and not of kind separates them.

The very exceptional disposition in the bat for the skin from the trunk to extend the entire lengths of the limb, and in the case of the anterior extremity to form enormous webs between the produced digits, is associated with an inclination for the ears to become greatly expanded and for cutaneous offshoots to appear at the muzzle, chin, and the sides of the face. Even the prepuce is disposed to be redundant. Together with this inclination, dermal structures are highly specialized, so that the sebaceous glands, hair follicles, and tactile bodies are well developed. It can be readily surmised that special adaptations for a variety of purposes occur in this group of structures, so that secondary sexual characters are found in the gland masses of the skin of the neck, and of the skin folds, the details in the ears, the pouches of skin, etc., are available for purposes of classification.

THE EXTERNAL EAR.

In this connection let us glance at the peculiarities of the external ear. The external ear is markedly modified from the type usual in quadrupeds. Its simplest expression is seen in the Pteropidæ and the Rhinolophidæ. In these families the widely separated auricular cartilages are closely enwrapped by integument and the tragus is said to be absent. (See below.) In such an ear the terms *inner* and *outer borders* and *tip*, exhaust the list which are demanded in their description. In the ears of the remaining families it is far different. The auricle here is expanded to degrees which bring the outer parts to a greater or less degree downward and forward on the upper parts of the neck and reach the region of the mouth, or even the chin, while the inner border, being guarded by a skin fold which connects the ear to the crown, is disposed to be united with the corresponding part of the ear of the opposite side and extend in varying degrees toward the snout. Skin lappets arise from both inner and outer borders. Those from the inner border from a long appendage which lies in advance as defined in the simple ear and becomes the *internal hem.* As a rule it ends as a free lobe inferiorly, which thus becomes the *internal basal lobe.* The line of the true internal border being always discernible becomes the *internal ridge.* The external border, which is distinguished from the true external border which now becomes the external ridge is also disposed to form a hem (*external hem*), which, however, in contrast to the inner is apt to be divided into an upper and a lower part; the upper part forms the *first scallop*, and the lower the *second scallop.* The free lower end of the outer border becomes the *external basal lobe*, which may be separated from the lower scallop by a deep *basal notch*, or the second scallop may extend across this notch and the external basal lobe and becomes continuous at various distances with the face or that over the lower jaw. These parts will not receive distinctive names. In most examples the auricle is also conveniently divided into an anterior and a posterior part, the anterior part is marked, if marked at all, by lines repeating that of the internal border, while the posterior part is marked, if marked at all, by conspicuous transverse lines or striæ. The hair when it extends upward on the ear from the crown is usually of the color and character of that of the crown, while that of the posterior is of the color and character of that of the neck.

The *tragus* varies exceedingly in form. The following terms are employed in its description, viz, the *inner* and *outer border*, the *tip*, the *notch*, which is near the base of the outer border, and the *basal lobe*, which lies below the notch. The tragus is said to be absent in Pteropidæ and Rhinolophidæ, but in some examples of the family last named a rudimental tragus can be discerned. The tragus always arises from the ridge which lies in front of the auditory meatus and connects the inner and outer auricular borders. It is of interest to observe that while this connection with the borders is imperfectly defined in most bats that in the recently discovered *Euderma* it is markedly so united and tends to constrict the basal parts of the enormous auricle.

Not only is this the case, but the ears are often united by a band (*inter auricular membrane*) which extends obliquely forward. In *Corynorhinus* and *Macrotus* it is on the face, and in *Promops perotis* reaches quite to the snout.

In illustration of the value of the ear in classification the following table is drawn up from the members of the bats described in this memoir.

Phyllostomidæ.—External ear without internal basal lobe. External ridge rudimental or absent. External basal lobe not marginal, but lies well within the large second scallop, which is continued well in front; tragus prorect, coarsely crenulate or spinose on outer border.

Molossi.—Ear without internal basal lobe. Internal ridge produced forming a "keel." External ridge marginal, produced, bounding external basal lobe. External basal notch open, *i. e.*, not covered by lower scallop; tragus rudimental.

Vespertilionidæ.—Ear with internal basal lobe. Internal and external ridges rudimental, not produced. External basal lobe marginal (except Plecoti), not touching external basal ridge. External basal notch occupied by produced lower scallop. Tragus obscurely crenulate on outer border, or smooth.

SECONDARY SKIN DEVELOPMENTS.

At the muzzle the skin folds are median and lateral. The margins of the nostrils expand above and at the outer side while they are separated by a groove or a ridge in the middle line, as is seen in *Brachyphylla* and *Nyctinomus*. Or the two lines of perinarial expansion may meet below in the space between the nostrils and the lip to form a swollen ridge as in *Glossophaga* or a lappet as in most *Vampyri*, while the internarial ridge is continuous with a vertical leaflet. This is the type seen in most of the Phyllostomidæ as exemplified in this memoir in *Artibeus* and *Macrotus*. The nostrils may remain simple with the upper border advanced upon lumen of the opening so as to divide it into two cornua as in most Vespertilionidæ or the lumen may be oval as in *Euderma*.

In all the genera in which the foliations about the nostrils are well developed the outgrowths occur in positions of structures which can be named in the muzzles of other mammals. Thus in *Rhinolophus* (and at least in *Hipposideros*, so far as examined) the upper or inner margin of each nostril leads to the development of a fold (supra-narial) which by uniting with its fellow forms the anterior of the two ascending leaflets or the sella; the lower or outer margin leads to the development of the lateral fold (infra-narial), which passes back to form the lateral margin of the posterior ascending leaflet or the terminal leaflet; the muzzle glands are continuous posteriorly, with a short skin-fold which joins with the lateral fold to form the terminal leaflet. The supra-narial also joins the terminal leaflet from in front. The three plications end on the terminal leaflet at the part where it frees itself from the head. Various supplemental folds occur in *Hipposideros*, none of which, however, disturb the plan. The scheme described for *Artibeus* is essentially the same, excepting in the fact that a single ascending leaflet is formed, to which both supra narial and infra-narial folds contribute. In *Ectophylla* the entire muzzle-gland series becomes foliate, thus exhibiting a complete development of a tendency announced in *Rhinolophus*. In *Nycteris* the supra and infra narials do not assist in forming a median structure, but remain well out on the side of the face.

The lower lip is firmly held to the gum of the lower incisor teeth, as in Vespertilio, or it is free and forms a protrusile, membranous fold as in *Atalapha*. It may be entire or divided in the center so as to form two chin plates as in *Macrotus* and, as a variation, in *Nycticejus*. In *Atalapha* a distinct lappet extends entirely across the chin and in degrees of development distinguishes the sexes. The chin itself and the space directly back of it is adorned with scattered warts in all forms, but in *Phyllostomidæ*, as shown in *Artibeus*, the entire chin is conspicuously adorned with verrucæ arranged in median and lateral groups. In *Chilonycteris* and *Mormops* these are the sites of curiously complex leaflets.

The sides of the face are furnished with skin-folds of various lengths, which are continuous with the external border of the auricle, or a large wart lies directly back of or below the angle of the mouth, while the sides of the muzzle are apt to be more or less thickened by swollen gland-masses, which tend to embrace the side of the nose-leaf as in *Artibeus* and *Macrotus*, or ascend toward the vertex of the face, where they either approach each other on the top of the muzzle as in *Antrozous*, or end free as in *Corynorhinus*.

THE HAIR.

The hair of the body is arranged in regions having well-defined boundaries. The crown of the head, the region directly in front of the ear, the neck, especially the side and back, inclusive of a line across the top of the chest, the shoulder itself, the sides of the under surface of the body, the rump, and pubis are all regions which are often separately colored, or clothed with hair of distinct texture, or rate of development than that of the other portions of the body. The sides of the neck are always furnished with longer hair than is the front and ordinarily than is the back. The hair of the pubis is more woolly than that seen elsewhere. The hair extends farther on the dorsum of the face in *Vespertilio* than in most genera. The same region is naked in *Adelonycteris*. The shoulders are occasionally furnished with shades of color contrasting with that of the rest of the body.

The membranes are clothed with hair in varying degrees. The greater area is naked. The interfemoral membrane is more thickly clothed on the upper than the lower surface, a tendency reaching its maximum in *Atalapha*, while the lower surface of the wing membrane between the body and the border of the manus—a tendency also marked in *Atalapha*, but most marked in the Asiatic form of the noctule bat (*Noctulina noctula lasiopterus*). As a rule the fur from the under surface of the body extends from the upper third or half of the arm to the knee. The presence of a clump of hair on the dorsum of the forearm is a good peripheral character for *Atalapha cinerea*. The interfemoral membrane as a rule is covered with an extension of hair from the rump to the basal third in Vespertilionidæ. In *Vespertilio* an interesting character is noted in the clump, not being well defined, but straggles downward in an irregular manner and is lost near the ankle. This disposition is especially developed in *Vespertilio capaccini* and in the Nevadan variety of *Vespertilio nitidus ciliolabrum*. The lower border of the membrane is constantly fringed in some forms of *Vespertilio*, but as an individual variation in the North American species. It is rare to have the lower border of the wing membrane from the foot to the manus fringed as in *Pteropus*, but *Vespertilio*, as seen in North America exhibits a singularly constant, minute bristle which overlies the membrane at the tip of the fifth finger. The ears are apt to be sparsely haired on the inner surface near the anterior border, on the outer surface at the basal third or half, and on the external basal lobe. On the whole the bats which take the prone position in rest are less heavily furred than those which are pendent. In one of the most marked forms of the former group (*Cheiromeles*) the skin is nearly naked. Interesting contrasts can be made in this way between the haunters of caves, attics, and old tree trunks and those which are caught hanging from the smaller branches and twigs of trees and bushes.

Bristles (setæ) usually surmount warts (verrucæ). They are best developed on the face of Molossi, though they may be found in the group last named on the upper surface of the interfemoral membrane. The very long hairs of the sides of the muzzle, which are so conspicuous in many of the small mammals of other orders, notably the Rodentia and Carnivora are absent. The best examples are met with in *Vespertilio* and *Choeronycteris*. Fringes of bristles adorn the margins of the toes in Molossi.

In describing bats in this manner the attention which has been given to the details of the coloring and the markings on membranes require an exact use of terms.

When hair arises from the membrane it will be seen that the clumps follow the directions of the trabeculæ and are detected in the translucent wing as minute black dots arranged in rows. These must not be confounded with pigment spots which dot the naked spaces of the wing in some species.

GLANDS.

The skin glands are best developed on the sides of the face directly back of the muzzle. In Molossi a large, median, coarse sebaceous gland lies depressed on the under surface of the neck. It is best developed in the male. An elevated thoracic medianly placed gland is present in *Ametrida*. The mammæ are large during the lactating period when the nipples are projecting and the aveolar space naked. At other times the nipple disappears and the gland is reduced to the smallest possible proportions. In *Saccopteryx* and its allies the wing membrane above the anterior extremity is furnished with a sack which is lined with folds which yield a fetid secretion. The position and size of this sack furnish excellent characters to distinguish genera as well as sexes of individuals.

COLORATION.

It is necessary to state that the colors for the most part are described from alcoholic specimens which have been removed from the spirit and permitted to dry. Mr. F. W. True writes in the Smithsonian Report for 1888 that alcohol disturbs the color-scheme of a mammal. The character of alcohol is not especially here named and the remark is undoubtedly correct for specimens which have been preserved in wood spirit. However, none of the specimens used for this study have been preserved in other than commercial alcohol which has been variously diluted with water. I have observed no differences of the kind named between the few living individuals I have seen, the fur of the dried skin prepared in the usual way with arsenic and in skins dried after prolonged immersion in commercial spirit. It must also be remembered that since all the material available has been preserved in the same medium the comparisons are sufficiently exact for purposes of identification of museum alcoholics. It is barely possible that the color description may require modification as contrasted with that based upon living specimens.

THE SKELETON.

The skull.—In describing the skull in bats, I have borne in mind that the form of the brain gives expression to the shape of the brain-case to a far greater degree than is the case in other mammals. The divisions of the brain are readily outlined externally, and yield convenient boundaries, since the shapes of associated parts harmonize in some degree to them. Thus the region of the proëncephalon, of the mesencephalon, and of the metencephalon are defined. In like manner the impressions made by the lines of attachment of the temporal and masseter muscles, the former on the cranium, the latter on the lower jaw, are valuable. For the temporal muscles I have named the median line between the two the *sagittal crest*, or line, and the anterior and posterior temporal impressions the *anterior* and *posterior temporal ridges*, or lines.

On the under surface of the skull the size and direction of the process (sphenoidal tongue) which extends backward and outward from the basisphenoid is worthy of notice. As compared to other mammals, the cochlea is unusually large at the base of the skull, and is, as a rule, but partially concealed by the tympanic bone.

The otic capsule varies in the degree in which bony laminæ occupy the spaces created by the semicircular canals. On the side of the skull the surface (opisthotic) which adjoins the squama in mammals generally is in bats crossed by a process of the squama uniting with one from the exoccipital, as in *Atalapha*, or the surface is free as in *Nyctinomus*. The old-world genus *Hipposideros* resembles *Nyctinomus* in this particular. When the otic capsule falls out, as it is apt to do in the overmacerated skull, a foramen or a notch is always defined between the squama and the occipital bone. Sometimes a foramen of the same significance, viz, one occupied by the opisthotic during life, is seen on the occiput.

The otic capsule in Pteropidæ alone is inclosed in bone, to form a triangular wedge comparable to the *os petrosa* of other mammals. As a rule, the form of the cochlea and semicircular canals are outlined as though in the human skull the encapsuling petrosal bone had been chiseled away; the degrees in which thin plates of bone fill in the semicircular canals being alone subject to change. The horizontal loop in all forms examined is filled with bone.

The following scheme of the otic elements will be found useful:

External loop entirely occupied with bone:

Superior loop angulated, open	*Artibeus.*
Superior loop nearly filled	*Nyctinomus* (*N. brasiliensis*).
Superior loop about half filled	*Atalapha.*

External loop almost entirely occupied with bone:

Antrozous,
Vespertilio,
Adelonycteris (*A. fuscus*).

External loop and superior loops not occupied with bone:

Noctilio.
Macrotus (occasionally excepted).
Hemiderma.
Chilonycteris.

The tympanic bone is sometimes incomplete, as in *Vespertilio*, at its upper arc, where it limits the zona tympanica superiorly. The bone constitutes the bulla, which presents various degrees of extension over the cochlea or forward along the side of the glenoid fossa. The width of the origin of the sterno-mastoid muscle is much greater than in mammalia generally. This interval in *Artibeus* equals one-seventh of the greatest length of the skull, while in *Canis* it equals one-nineteenth.

Seen from above, the face is described as forming a *vertex*. This extends from the region of the proencephalon to the upper border of the anterior nasal aperture. On the side the region of the face is equal to the length of the dental series. The orbit is, strictly speaking, that portion of the skull which accommodates the eyeball; but this is much smaller than the space as defined by the bony limits, as seen in many other mammals. Since custom has sanctioned an acceptance of an *orbital region* which would be limited posteriorly if a process were present extending from the anterior temporal ridge toward the zygoma, a similar region so restricted is held to be a valid one in all bats. In some genera, indeed, as those of the Emballonuridæ, the post-orbital process is constantly present, and in the Pteropidæ varying degrees of posterior limitations of the orbital region are seen. The face, including a part of the frontal bone, is inflated at the side in bats. I have called this the *fronto maxillary inflation.* It forms a ridge or swelling at the upper border of the orbit. The inflation of the skull at the anterior part of the frontal bone to form the frontal sinus is much less conspicuous in the Cheiroptera than in some other orders, but the maxillary inflation is greater. This peculiarity gives the face a broad effect at its junction with the brain-case and modifies the shape of the orbit. The *ethmoidal plates* variously change the shape of the inner wall. As a rule, the frontal bone here permits the ectoturbinal parts to be in part defined. The region of the lachrymal bone appears to resist the disposition to inflation; hence the peculiarities of the inflation give character to this portion of the cranium. On the vertex the inflation causes the face to widen from the proencephalon to near the anterior nasal aperture, where it is abruptly narrowed, and to create depressions of inconstant kinds in the line of the conjoined nasal bones. The extent to which the recession of the nasal bone from the anterior nasal aperture occurs, as well as of the palatal notch, due to the rudimentary state of the premaxillæ, afford bases for some characters of minor value. The length of the infra-orbital canal and the peculiarities of the outer wall of the canal are of interest. In *Artibeus* the canal is long and for the most part smooth externally, as in *Canis*, while in the fauna generally it is short, as in *Felis*, and the outer wall is often elevated.

The hard palate may be either in the main axis of the skull, as in most forms, or deflected upward and forward. The characters furnished by the pterygoid processes, the palatal plates, are here as useful as in other mammalian groups. The premaxillæ are rarely firmly united to one another. When they are so united, as in Phyllostomidæ and Molossi, the median incisors are disposed to be contiguous. When they are not united, a large median interspace separates them and is continuous with the vacuity which in other mammals represent the incisorial foramen. The presence or absence of the spheno-palatine foramen is used in some groups, as Molossi and in Plecoti, in separating genera. The disposition of the turbinals is also of interest, the peculiarities of the arrangement being definitive of the families as established on other structural characters. If in mammals generally an outer and an inner turbinal group is recognized, then in the bats we have a median lamina which bears upon its inner surface one or more scrolls (endoturbinals), and an outer lamina with much simpler accessories (ectoturbinals). The simplest arrangement of the turbinals is seen in the Nycteridæ and Rhinolophidæ, the most complex in Pteropidæ. In *Natalus* alone is the ectoturbinal rudimental or absent. (Bull. Mus. Comp. Zoöl., Feb., 1880.)

In addition to the peculiarities of the masseteric impression on the lower jaw, already noticed, characters are furnished in the height of the coronoid process and the degree of deflection as well as the size and shape of the angle. The post-symphysal spine which is conspicuous in some extinct forms has not been seen by me in any of the extant forms (*Promops* perhaps excepted), and I have examined most of the genera of the order.

The shortening of the face, *pari passu*, with reduction of teeth, is seen in Carnivora. The tendency is seen in *Vesperugo*, and in bats generally. In *Vespertilio* the shortening of face is accompanied by displacement inward of the premolars. In a mechanical sense it amounts to the same as reduction in number. In pteropine bats a remarkable persistence of facial length remains, while the disposition to reduction is evident. One may conclude from the instance last named that the shortening of face and reduction of teeth are independent. The same is true of the Ungulata.

In *Atalapha* the lower jaw closes in front of the upper. The lower canines articulate with the anterior surfaces of the upper laterals their entire length. The upper canines are free, *i. e.*, do not articulate with anything.

Vertebral column.—The vertebral column is without large processes other than the hæmopophyses which are well developed in the cervical region.

The *atlas* is broadest in Pteropidæ. In both *Pteropus* and *Epomoph-*

orus the bone extends downward posteriorly and at the sides so as to conceal the lower opening of the canal for the vertebral canal. The upper border of the conjoined laminæ is boldly rugose. In *Artibeus*, a member of a group in the New World analogous to the foregoing, the atlas is greatly reduced in the proportions of the laminæ and the transverse process, the lower opening of the canal for the vertebral canal is exposed on the posterior aspect of the bone, while the upper border of the conjoined laminæ is scarcely rugose. In the vespertilionines, molossines, and phyllostomines minor peculiarities distinguish the atlas. These are given in the diagnosis of genera and species. In a general way it may be said that the pteropines are broadly separated from all the other bats by the characters presented by this bone. In *Pteropus* and *Epomophorus* the *axis* possesses a large neural spine which almost equals the length of the body inclusive of the cylindroid odontoid process. In *Artibeus* the spine is but one-half the length of the body, inclusive of the tubercle-like odontoid process. The remaining portion of the cervical is curved more or less antero posteriorly. This is less marked in the pteropine and phyllostomine genera than in the vespertilionine, where the curve is so great as to bring the occiput almost to the first dorsal vertebra. The *sacrum*, at its upper portion, exhibits a compressed projecting ventral surface. The spinous processes are flat, distinct, and increase in size from above downward in molossines and *Atalapha*, but they are low and confluent in many forms as in the pteropines. The first coccygeal vertebra in tailed forms is large and resembles those of the sacrum. The *caudal vertebræ* below this are cylindroid. They vary greatly in length, especially at the beginning of the series.

Ribs.—The first and second ribs are flat and broad (coalescent in *Natalus* and *Hipposideros*), but as a rule have a wide interspace. The other interspaces are also well defined in Pteropidæ, but are often narrow, and in *Natalus* and *Hipposideros* are practically obliterated. The costal cartilages are relatively inelastic and are disposed to become early calcified. Indeed, the entire chest is rigid, and the ribs often become anchylosed to the spine, and in some forms, as in old individuals of *Vespertilio murinus*, the contiguous ribs to each other. Hence the respiratory movements are for the most part performed by the diaphragm and the flank muscles.

Sternum.—The prosternum is broad and massive, while both the mesosternum and metasternum are narrowed. The prosternum sends a conspicuous process forward into the neck (as in many terrestrial mammals) in molossines; all the others are without this process. The first joint is usually conspicuously keeled, and in Pteropidæ this keel is divided by a deep notch. The mesosternum in the same family is also keeled its entire length, but in the other groups it is barely ridged or smooth.

Anterior limb.—The *clavicle* is present in all bats. It is firmly attached at both the acromial and the sternal end. The last named effects an important articulation with the cartilage of the first rib and in the sterno-claviculo-costal joint; in Molossi, at least, it is of enormous strength. The *scapula*, as in other claviculate forms, with few exceptions, in which the large anterior extremity is not supported on the ground, possesses an infraspinatus fossa very much larger than the supraspinatus. The bone lies well up on the side of the neck in the forms in which the cervical series of vertebræ is bent forward. Excellent characters are yielded by the coracoid process. It is always long and slender, simple, and gently curved in various arcs in Pteropidæ, Rhinolophidæ, Emballonuridæ, and Phyllostomidæ, but bifid in most Vespertilionidæ. It is interesting to find the genus *Vespertilio* aberrant in this respect, the process being simple and curved quite as in the larger groups first named. The posterior tubercle is prolonged to form an oblique posteriorly-directed process in *Lasionycteris*, and the molossines *Atalapha* and *Chalinolobus*.

With the exception of the tuberosities of the *humerus* no check processes exist anywhere in the bones of the limbs, thus presenting marked contrasts with the limbs of birds. The trochlear end of the humerus yields in the shape and direction of the epitrochlea valuable characters. This process conforms to the terrestrial type, *i. e.*, it is transversely inclined in pteropines and the genus *Saccopteryx;* is deflected downward parallel or nearly so to the shaft in phyllostomines and molossines, but is absent in vespertilionines. In vespertilionines again the articular surface is axial, *i. e.*, is in the middle line of the humerus, but in phyllostomines it is thrown well off to the outer side. Narrow-winged forms, as the molossines and the genus *Atalapha*, exhibit large tubercles on the humerus and wide trochlear surfaces. Thus these characters harmonize with rapid flight. On the other hand, the forms with smaller tubercles and narrow, poorly defined trochlear surfaces have broad wings and presumably slow flight.

The *radius* constitutes the main support of the forearm and presents few variations from a single type. As a rule it is nearly straight, but is much bent in *Hipposideros*. It is always obliquely grooved by the tendon of the extensor ossi metacarpi pollicis. The size of the large, deep fossa for the insertion of the biceps flexor is variable. Since the ulna does not enter into the composition of the anterior arc of the trochlea, and its place is here taken by the radius in addition to the work this bone does in articulating with the humerus at its outer half, it is easily seen that the radius is provided with two facets at its proximal end, and that the main ridge on the distal articular surface of the humerus fits in between these two radial facets. So far as the degree of invasion of the radius into the trochlea has been noted it appears to correlate with the degree of activity of the prone form in scurrying. It is thus marked in *Cheiromeles* and *Molossus*, and is small in *Kerivoula*.

The *ulna* is more inconstant in form than the radius; in all it is incomplete and is composed of a proximal and a distal rudiment. The proximal rudiment is free at the weak olecranon, which resembles the parts in the sloth, and is continuous in most genera with an arched rod-like shaft of uniform width, which is ossified, as a rule, with the radius at about its proximal third. Exceptions are noted to this arrangement in some of the vespertilionine genera, *e. g.*, *Scotophilus* and *Miniopterus*, as well as in the molossine *Promops*, in which a small anchylosed olecranon unites by a filiform shaft to the proximal third of the ulna. But the vespertilionine forms as a rule (*Harpiocephalus* not examined) retain a free olecranon which is continuous with a filiform tapering shaft, which ends free in the muscles of the forearm. *Corynorhinus*, *Nyctophilus*, *Chalinolobus* are exceptions even to this arrangement, for here the shaft is entirely absent, the rudimental fixed olecranon constituting the entire proximal end. The tendon of the triceps muscle as it is inserted into the ulna is occupied by a sesamoid bone. No other animals possess a bone in this situation. It is either a separate ossicle developed in the tendon, or the disjuncted epiphysis of the ulna. This relatively unimportant bone receives the muscle which alone extends the powerful forearm. The extensor carpi ulnar is a muscle as constant in this group as in others—arises from it. All the relations of the ulna, therefore, are with the extensors. The distal end is anchylosed to the radius at the wrist. The form may be that of a quadrate plate, more or less well defined, which is usually entire, though it may retain a minute foramen of insufficiency, as a rule, in the vespertilionines and molossines. The plate may be absent when a hook-like process directed proximally, as in *Atalapha;* it may project nearly at right angles to shaft and be conoidal, as in phyllostomines, rhinolophines, and the genera *Saccopteryx* and *Natalus*; or it may be absent, as in the pteropines.

The *carpus* of bats exhibits some valuable characters. In all forms the first row of bones is composed of two bones only—viz, a large bone which constitutes the greater part of the row and will here receive the name of the scapho-lunar, and a small separate bone at the ulna border of the scapho-lunar which appears to be the cuneiform.

The second row is composed of the trapezium, trapezoid, os magnum, unciform, and often the pisiform. The os magnum and unciform always unite to fornra convex surface for articulation with the second row. With the exception of the pisiform all these integers are easily recognized. The carpus on the whole is simple, since the first, second, and third metacarpal bones are in axial articulation with trapezium, trapezoid, and os magnum, respectively, while the fourth and fifth metacarpal bones articulate with the unciform.

In pteropines the trapezium and os magnum are greatly larger than are the other bones of the second row, and give a peculiarly massive appearance to the carpus when the wing is folded. The bone first named is without nodosity on the palmar aspect. Wedged between the two bones last named is the insignificant trapezoid. Owing to the abruptly curved line formed by the heads of the metacarpals the second and fifth bones lie at the level of the plane which would unite the ends of the curve, while the third and fourth form the bottom. The cavity defined by the curve as indicated is almost entirely occupied by a large hatchet-shape prolongation of the os magnum. Thus the os magnum, beside its axial attachments, is held on the one side to the second and on the other to the fifth metacarpal bone. The heads of these bones are so disposed as not to approach each other. The pisiform is absent unless it is represented in the palmar prolongation of the os magnum.

In rhinolophines the plan is that of pteropines. Though the bones are less massive than in that group, the methods of articulation are the same, and the pisiform is also apparently absent.

In *Artibeus* the palmar part of the os magnum articulates with a separate but much smaller element, which occupies the place of the hatchet-shape plate in *Pteropus*. The heads of the metacarpals are scarcely curved, and those of the second and fifth are disposed not to approach each other.

Among the vespertilionines we notice the following: *Corynorhinus* closely resembles *Artibeus*. In *Adelonycteris* the trapezium possesses a tubercle on the palmar aspect; the os magnum is without palmar plate, either united or separate. The heads of the second and fifth metacarpals approach each other and almost touch. In *Atalapha* the tubercle to the trapezium is retained, while the palmar extension of the os magnum is absent. Articulating on the pollical side of the fifth metacarpal bone is a separate ossicle, which appears to take the place of the part last named. It is elongated and much larger than any of the carpal elements. I have named it the pisiform. *Antrozous* is much the same as *Atalapha;* the ossicle by the side of the fifth metacarpal bone is triangular in shape. The plate of bone which is continuous with the os magnum on its palmar aspect in pteropines appears to be the same as the separate ossicle in the same situation in *Artibeus*.

The bone which articulates by its base with the fifth metacarpal bone in *Atalapha* and *Antrozous* would appear to be identical with the above plate, since when it is present the os magnum ends in a simple manner toward the palm. It would appear to be the pisiform, since in *Atalapha* it was observed to receive the tendon of the extensor carpi ulnaris.*

Sesamoid bones.—The sesamoid bones are found in locations where great motion is permitted on the side opposite to which the bones are lodged—the purpose being apparently to prevent stretching of the muscles which carry the sesamoids. At the point at which stretching would begin the bones lock with the joint surface and takes the strain. They are well developed in the tendons of the extensors of the first, second and third metacarpal bones, especially in the phyllostomines.

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*The difficulty of studying the carpus without decalcification and making sections for microscopic study is conceded. The above epitome will doubtless be modified in details when such a method of study is adopted. The pteropines and true rhinolophines are seen to be in alliance by characters derived from the carpus, a position which is in harmony with the absence of the tragus and the compact form of the otic bones.

The tendency above noted for the second and fifth metacarpal bones to incline toward one another on the palmar aspect of the carpus, and as a result for the second bone to lie in front of the third and for the fifth to lie in front of the fourth, is a notable feature in the manus of the bat. Minor differences are seen in the relative lengths of the bones. They are shortest in pteropines and rhinolophines. The second metacarpal is usually slightly shorter than the others, but in Hipposideros it is much shorter. The fifth metacarpal bone is apt to be the largest, as in *Pteropus*, but in *Hipposideros* and in the molossines it is the shortest. In the group last named and the related genus *Atalapha* the bones are marked by grooves for the powerful metacarpo-phalangeal flexors. The third metacarpal bone is commonly the largest, the fifth the shortest, the fourth being intermediate, yet in North American species of *Vespertilio* the fourth bone, being slightly shorter than the fifth, is sometimes an individual variation. *Megaderma* is remarkable for having the above order reversed—the fifth metacarpal is the largest and the third is the shortest. Viewed as a whole the manus, notwithstanding its enormous longitudinal development in the third, fourth, and fifth elements, is singularly unimportant in the first and second. The second, however, while unsupported by elongated phalanges, has strong architectural functions at the line of its union with the carpus.

The degrees of rigidity of the joints of the manus vary greatly. The metacarpo-phalangeal joints of the Rhinolophidæ are quite rigid in all the forms examined. In most forms this joint in the fifth finger is less flexible than that of the other fingers. All things remaining the same, the degrees of rigidity are least marked in the third finger and most marked in the fourth and fifth, a proposition in harmony with the manner of dividing the manus, namely, with the ærial movement (abduction) of the first, second, and third digits away from the fourth and fifth, which in their turn are more disposed to remain stationary, and thus tend to make rigid the main portion of the wing membrane.

The forms in which the second and third digits are approximated, and the digit last named is widely separated from the fourth, embrace the Molossi, the Vespertilionidæ, and the remote Pteropidæ; those in which the converse appears, at least in which the second and third digits are relatively wide apart and the third digit not notably removed from the fourth, include many widely-removed groups, namely, the Phyllostomidæ, the Rhinolophidæ, the Epomorphi, the Plecoti, and Natalidæ. It will be seen the arrangement last named prevails in the largest number of forms.

The phalanges present few points of contrast. They are uniformly elongated rods. As a rule the second digit possesses a single rudimentary phalanx which may be free or semianchylosed to the metacarpal. The highest degree of development is attained in the pteropines and in the genus *Rhinopoma*, the former having three and the latter two phalanges. In the pteropines the third is ordinarily furnished with a claw. The phalanges vary greatly in the range of motion, those of the second and fifth digits being the least mobile; in their relative lengths in the pteropines and the genera *Noctilio* and *Miniopterus*, these forms being remarkable for the degrees present of lateral and dorsal flexion. It has been noted on p. 5 that the disposition and relative sizes of the phalanges vary in the scurrying and pendant forms. In the position of flight the row of first phalanges is flexed downward, but the row of second phalanges is at the same time deflected laterally; *i. e.*, toward the body. In the position of rest the parts either remain axially disposed or the row of the first phalanges is laterally or dorsally flexed, as in the molossines and emballanourines. The terminal cartilages are apparently absent in pteropines and rhinolophines. When present they remain in axial line with the phalanges, as in phyllostomines (excepting *Vampyrus*), or they are deflected from that line, as in vespertilionines and molossines. These little rods appear to be indices of the amount and direction of strain to which the membranes are subjected, and point, therefore, to distinctions in methods of flight. It may be said that they are absent, or, if present, axially disposed in the broad-winged forms, but are deflected in the narrow winged.* In vespertilionines (excepting *Corynorhinus*) the fifth digit is provided with an accessory cartilage, which lies to the outer side of the terminal cartilage. It slightly projects from the margin of the wing membrane.†

The usual number of phalanges to each digit is two. In Phyllostomidæ the number is three to the third digit, the fourth and fifth having two each. Yet in a specimen (apparently normal) of *Phyllostoma hastatum* I note three phalanges in the fourth digit as well as the third. The third phalanx is probably a segmentation of the second rather than a distinct joint added peripherally to the series. At least it so appears

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*The significance of the cartilaginous tips to the digits is not clear. At first sight they appear to be of the value of distinct phalanges, and I have until recently held to this view, but examination of sections under the microscope yields no indication of segmentation, nor does inspection of embryos show stages in which separate elements exist. Nevertheless I note in *Macrotus* excess of segmentation of the last phalanx, and Dobson observes the same in the Molossi. Interesting properties are noted in the elements of the metacarpal and phalangeal series. As a rule, they are rigid and brittle. In *Furia* these peculiarities are so marked as to make it difficult to handle a specimen without incurring a chance of breaking these exceedingly delicate structures. In the Phyllostomidæ, on the other hand, they are apt to be yielding and elastic, and suggest (at least in the case of the second and third digits) that the bones are imperfectly ossified. Mr. C. Percy Moore, of the University of Pennsylvania, who has kindly investigated the subject for me, states that after attempts at decalcification the digits of bats everywhere yield tough matrices.

†Pr. Acad. of Nat. Sci.

in *Thyroptera* (an annectant genus between the American naked-nosed and leaf-nosed forms), where the length of the second and third phalanges about equals that of the second phalanx of the same digit in the allied genera *Furia* and *Natalus*.

The much greater length of the third digit, as compared with that of other digits, is a noteworthy feature of the bat wing. Its relative length in different forms serves as a guide to generic and sometimes to specific distinctions.

The peculiarities of the thumb are so marked that they can be best considered apart from the other manal parts. The thumb, as a rule, is free from membrane beyond the basal third of the first phalanx, but may be almost entirely inclosed, as in *Thyroptera*. The extent of the enwrapping membrane determines the size of the little fold of skin which lies between the thumb and the second metacarpal bone. The thumb is relatively large in pendent forms, since it is here of value in prehension; *per contra*, in *Thyroptera*, in which genus a suctorial disk takes the place of a prehensile thumb, this digit is also small, though the animal is unadapted to activity in the prone attitude. It has been already noted (p. 5) that the thumb is bent downward and the under surface of the first metacarpal bone fairly well outlined in the pendent forms. It is not known how *Desmodus* and *Diphylla*, which process with large projecting thumbs, support the body when at rest. The claws on the feet are weak, and the animals are probably not pendent at rest. With these exceptions, the phyllostomines possess the semi-flexed thumb, as do all the other families excepting the molossines and vespertiliones.

Posterior limb.—The innominate bone always exhibits a narrow rod-like ilium which occasionally projects slightly above the line of the ilio-sacral articulation, but as a rule is level therewith. The dorsum of the ilium is flat, in most forms, but it may be concave and broad, as in molossines, *Atalapha* and *Chilonycteris*. The pubis is, as a rule, defined in the males, but is absent and has a wide interval defined between the innominate bones anteriorly in the females. The shape of the ischium and of the thyroid foramen is subject to slight variation in genera and even in species. The innominate bone is in most forms distinct from the vertebral column. In molossines, *Chilonycteris*, and in rhinolophines, it is anchylosed, both at the sacro-iliac junction and the ischio-sacral or ischio-coccygeal junctions. *Chilonycteris* is an instance of the union last named. In all bats a disposition exists for the tuberosity of the ischium to approach the vertebral column, thus presenting a marked contrast to that seen in terrestrial quadrupeds. *Antrozous* exhibits a facet between the tuberosity and the first joint of the coccyx. The sloth is the only animal I can recall which exhibits a fixation of the ischium similar to that found in the bats. The ilio-pectineal spine is marked; often a large tubercle, it may be a needle-like spine. In *Hipposideros* it is of enormous length and is anchylosed to the ilium near its upper border.

The interest which attaches to the osteology of the hind extremity has led me to give in more detail the following:

In pteropines the ilium is curved outward to a slight degree at the crest. The ridge from the upper border of the acetabulum is inconspicuous and does not extend entire length of ilium; thus the ventral and dorsal surfaces are not separated and there is no special external border near the crest. The tuberosity of the ischium is deflected markedly from the line of the ilium and lies against the coccyx. The pubis is thickened inferiorly; the pectineal spine is absent or scarcely discernible.

In *Hipposideros* among the rhinolophines the *ilium* is expanded and is concave on both dorsal and ventral surfaces. The broad crest extends outward and unites by a broad thin flange to the tip of the long pectineal spine. Tuberosity of the ischium not projected backward; nearly the entire pubis and ischium converted into a broad plate of bone at the expense of the thyroid foramen. Symphysis pubis long, entire. The trochanters of the *femur* are drawn backward and approximated; the inner trochanter is the longer; the outer side of the shaft below the head furnished with a flange. The condyles small and separated by a wide notch. In the *tibia* the spine for hamstrings compressed. Internal tuberosity prolonged; no mallelus.

In phyllostomines the ilium is not deflected at crest. As seen in *Artibeus* the ridge above the acetabulum is rudimental as in pteropines—the ventral and dorsal surfaces therefore scarcely distinguished. The external border below the crest is rugose and enormously thickened. The ischium is turned but slightly toward the coccyx. The inferior border of the pubis produced inward as a long blunt process and the upper border forms a long, acicular process (pectineal eminence) which extends one-half the length of the ilium. The trochanters of the *femur* not carried back, the outer not separated from the head by a notch. The inner is much longer than the outer. The shaft at its inner side at the proximal fifths exhibits a conspicuous crest. The condyles are of equal size. Above them posteriorly is a depression (best marked over inner condyle) to receive in forced flexion the posterior border of the articular surface of the tibia. Intercondylar notch, pit-like. Proximal end of the tibia with scarcely any inward projecting process; malleolus none; tubercle for insertion of hamstrings markedly developed; surface for articulation with the fibula rugose.

In *Hemiderma* the innominate is much as in *Artibeus*, but the pubis not projecting or thickened; the pectineal spine but one-third the length of the ilium. The femur quite as in this genus, but the outer trochanter separated by a notch from the head. In *Macrotus* the innominate bone much the same as above, but the pectineal spine over one-half the length of the ilium. The trochanters of the femur approximated and carried well to the back of the shaft. The fibula only half the length of the tibia.

In *Mormops* the ilium is greatly compressed between the ventral and dorsal surfaces; first joint of the tail very long. The femur and tibia as in *Macrotus*. *Chilonycteris* in like manner exhibits a compressed ilium ossified to sacrum with broad rugose external border adjoining crest. Dorsal surface slightly concave and expanded. In both *Mormops* and *Chilonycteris* the tuberosity of the ischium is anchylosed to the sacrum. The pubis in the male of *Mormops* is bony and entire; in *Chilonycteris* it is less firmly defined. The pectineal spine in *Mormops* is two-thirds the length of the ilium. In *Chilonycteris davyi* it is remarkable for being nearly as long as this bone and bound by fibrous tissue to the vertebræ. In both of the genera of Lobostomidæ the trochanters of the femur are approximate, confluent, and carried well back of the head. Tibia and fibula much as in *Macrotus*.

In *Molossus* the innominate bone is compressed, expanded. It is concave dorsally with narrow iliac upper border slightly projecting. Pectineal spine one-third the height of the ilium. Pubic symphysis entire, bony. Tuberosity of the ischium projects well backward, but is free from the sacrum. The inner trochanter much larger than the outer; truncate with a downward-projecting spine, not carried backward. The outer trochanter separated from the head by a slight notch. Condyles equal in size; notch wide, shallow. Tibia straight with large malleolus.

In *Promops* the pelvis entire as in *Molossus;* characters much the same as in this genus, but the upper border of the ilium without spine and the tuberosity articulating with the sacrum, but not anchylosed thereto. Femur and tibia of the same character, the distal epiphysis of the femur narrower than the expanded shaft. In *Nyctinomus* the ilium as in *Molossus*, but the pubic bones free; femur and tibia the same.

In *Atalapha* the ilium is quite as in *Molossus*, but is not anchylosed to the sacrum. The pectineal spine is blunt, rudimental; tuberosity of the ischium lies in the same line with ilium, and approaches the sacrum, but is not articulated therewith. Both trochanters of the femur are carried backward as in Vampyri, but are not approximate, *i. e.*, they are visible from in front; the inner is the narrower, though they are of the same length. Condyles high and narrow, the inner scarcely the wider; notch narrow, deep. Tibia curved with medianly projecting inner tuberosity, malleolus scarcely discernible. Fibula entire; upper portion membranous. In *Antrozous* the ilium is anchylosed to the sacrum and in the male at least the symphysis pubis is well defined; the tuberosity of the ischium extends back of the line of the ilium and almost touches the sacrum. The pubic bone without a thickened inferior border. The femur and tibia much as in *Vespertilio*.

In *Vespertilio* the ilium is narrow, not expanded above, and not concave posteriorly; the outer border scarcely thickened near the crest. The pectineal spine low, compressed, directed slightly forward, blunt, scarcely higher than the acetabulum. The inferior border of the pubic bone greatly thickened near the symphysic line in the male. The innominate bone is lightly held to the sacrum and at the symphysis pubis. The inner trochanter of the femur equals the external. Both are small and the gluteal crest is scarcely larger than a flange which unites the inner trochanter to the shaft, thus making the femur unique. The inner condyle is slightly the larger and the notch narrow. The tibia with large projecting median spine at the proximal end; malleolus distinct.

In *Adelonycteris* and *Lasionycteris* the parts quite as in *Vespertilio*, the pectineal spine slightly longer; the shaft of the femur just below the head less expanded.

Corynorhinus much as in *Vespertilio*, but the upper part of the femur much less expanded, the shaft near the trochanter scarcely at all.

The femur is without neck. The outer and inner trochanters are subequal and of large size, the outer tending to become the larger as in the molossines. The outer side of the shaft below the trochanter is often marked by a flange in position of the third trochanter. *Hipposideros* and all phyllostomines show an inclination to the development of a conspicuous flange on the inner side of the shaft near the inner trochanter. This is most marked in *Chilonycteris*, *Mormops*, and *Natalus*. In the genera last named the trochanters are drawn backward, lie on the posterior surface of the bone, and are in close relation (resembling, with the head, the anterior end of a geometric larva), while as a rule they are on lines which answer to the lateral ligaments of the knee joint. The condyles are approximate markedly unequal with a narrow intercondylar notch, the inner condyle being the larger, as is the rule, or wide apart with small condyles, as in molossines and rhinolophines. The tibia may be shorter than the femur, as in *Artibeus* and *Molossus*, but it is, as a rule, longer than that bone. The inner tuberosity is furnished with a horizontally-projecting process in vespertilionines; this is an excellent character defining the family. The tubercle for insertion of the hamstrings is most marked in strictly arboreal forms, as the pteropines. The malleolus is often rudimentary or absent, as in phyllostomines and rhinolophines. The fibula is uniformly imperfect above save in the molossines, where it is complete, or in *Antrozous*, where a membranous fillet continues the form of the bone to the inner tuberosity of the tibia.[*]

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[*] Since the above sketch was written the skeleton of *Desmodus* has been examined. I find that it bears a close resemblance to other phyllostomines, but is distinctive in the following particulars: The shaft of the radius is joined at its middle by the ulna, which can be traced, nevertheless, apparently to the wrist. I say "apparently" for the femur, tibia, and fibula exhibit dispositions to form lateral flanges, and it may be that the structure in *Desmodus* is not the reappearance of the lost ulna-shaft but is simply the radius, which here exhibits an unusual form. In any event it constitutes a character not seen elsewhere in the order. The flanges of the femur are symmetrical, directed forward, and convert the anterior surface of the shaft into a groove for the origin of the femoral head of the quadriceps extensor muscle. The flange in the tibia and fibula is single; the two are in contact—to obliterate the interosseous space.

The toes retain two phalanges to the first toe; all the others have three, but differ in their relative lengths. The first phalanx of the first toe is, so far as examined, longer than that of the other toes. In *Pteropus* the lengths of the toes from the second to the fifth gradually diminish. In *Chilonycteris* they abruptly increase, that of the second toe being one-third shorter than the fifth. In all bats the tarsus and calcaneum are elongate and exhibit the general character of these bones in mammals, in which little or no weight is borne upon the posterior extremities. Both bones are so disposed that the larger end of each is directed proximally. In *Rhinolophus* the calcaneum enters into the ankle joint. In other forms the calcaneum is independent of the joint. In Phyllostomidæ, including *Natalus*, as well as in the genus *Rhynchonycteris*, the calcar[*] is placed in axial line with the calcaneum. In other families it joins the calcaneum to its outer side at a well-defined angle. As a rule the astragalus and calcaneum are nearly of one size, but in the genus last named the calcaneum is notably the smaller (Am. Naturalist, Feb., 1886, 176).

GENERAL PLAN OF ANTERIOR EXTREMITIES IN FLYING VERTEBRATED ANIMALS.

From the above consideration it will be seen that the wing membranes possess various features which can be used in distinguishing the members of the order. But after what manner are the flying mammals distinguished from other flying vertebrates?

There are two distinct types of modification which the vertebrate skeleton has undergone in adapting the animal for flight, both of which depend upon some peculiarity in the structure of the anterior extremities; and in order to obtain a correct opinion of them we propose to cast a glance at each in turn.

A plan of bony structure of the wings of flying vertebrate animals.

a. Bones of carpus ununited, distinct; flight maintained by dermal expanse.	I. Wing membrane supported by all fingers.	*Bats* (Vespertilio), order of MAMMALIA.
	II. Wing membrane supported by the fourth finger only (which is immensely developed), the others remaining free.	*Pterodactyles*, order of REPTILIA.
b. Bones of carpus united; flight maintained by dermal appendages.	III. Bones of metacarpus, two to three in number; feathers not radiating.	*Living birds* (AVES)—class.
	IV. Bones of metacarpus, four in number; feathers radiating.	*Archæopteryx* (AVES)—subclass.

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[*] The calcar is an element of doubtful homology. It supports the free border of the interfemoral membrane and is of the same significance as the accessory cartilage of the fifth manal digit.

a.

I. The Bat, in which the humerus is long and slender, with a small pectoral ridge. Ulna rudimentary. The radius constitutes the bulk of the forearm; carpus composed of six bones; the metacarpal bones, five in number, separate and distinct; the phalanges generally, two in number; thumb, and in some genera the index finger, surmounted by a claw.

II. The Pterodactyl, in which the humerus is short and straight, very broad at head, with angular and prominent pectoral ridge; ulna and radius distinct, of nearly equal size; carpus composed of five bones; metacarpus of four bones, separate and distinct; first finger with three joints, second with four, third with five, fourth with four joints, all provided with claws, with the exception of the fourth, which is remarkable for the extraordinary development of its several joints. It is from this last-mentioned finger to the base of the foot that the skin was stretched by which the animal was enabled to fly.

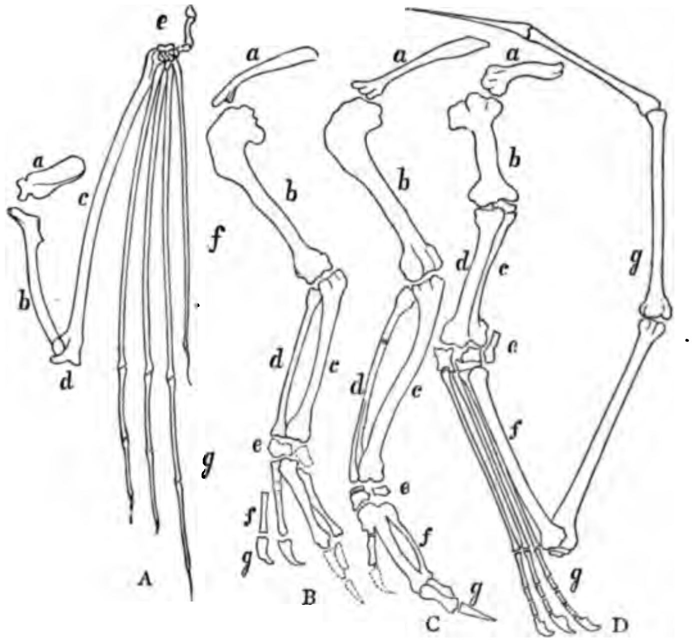

DIAGRAM OF THE BONES OF ANTERIOR EXTREMITIES OF FLYING VERTEBRATES.

A. BAT.—*a.* Scapula. *b.* Humerus. *c.* Radius. *d.* Rudiment of ulna anchylosed to radius. *e.* Carpus. *f.* Metacarpus. *g.* Phalanges.

B. ARCHÆOPTERYX.—References as in Fig. 1. The dotted outlines seen at carpus and the terminal phalanges are restored portions.

C. BIRD.—References as in Fig. 1. The dotted outline of the second ungual phalanx indicates the occasional occurrence of a claw at this point. The majority of birds are without it.

D. PTERODACTYLE.—References the same as in Fig. 1

b.

III. The Bird, in which the humerus is curved, more or less slender; pectoral ridge prominent, not angular; ulna large, curved, not united with the slender and more diminutive radius; carpus or two bones; metacarpus of two, sometimes of three bones, the first being small and cylindrical, the other two of larger dimensions and united so as to form a bone resembling those of the forearm; ulnar phalanx of one joint, united to the radial, which is composed of two.

The power of sustaining flight not dependent upon the expansion of skin, but upon the excessive development of dermal appendages (feathers).

IV. The Archæopteryx agrees with the typical bird in general particulars, but differs in the number of metacarpal bones, which are here four in number: the first and second are slender, free and separate from one another; the third and fourth bear considerable resemblance to those of extant birds, in being large, stout, and closely approximated; but are not, however, united.

Flight is supposed to have been maintained in the same manner as in living birds.

In addition to the instances already given, certain fishes, as the *Exocœtus* and *Dactylopterus*, possess the power of sustaining true flight. The mechanism that lifts the body of the fish from the water, and upholds it for a short time in the air, is obtained in the pectoral fins, which, in these animals, are enormously developed. The structure of these fins is homologous to that of the anterior extremities of other vertebrates, their form alone being modified to adapt the animal to the medium in which it is placed. Thus we have, in each great subdivision of vertebrate animals, a representative capable of sustaining flight.

Another somewhat similar modification of the animal economy is met with in a few animals of arboreal habits. Here a peculiar arrangement of the skin is observed, which enables the possessor to break the force of downward leaps. In the Flying Lemur (*Galeopithecus*), in the Flying Squirrel (*Pteromys*), and in the Flying Opossum (*Petaurista*), the furred skin extends laterally from the sides of the body and is attached to anterior and posterior extremities at the metacarpal and metatarsal regions respectively. The only instance of osteological development is obtained in the Dragon (*Draco volans*), a small lizard from Sumatra, in which long, transverse processes from either side of the lumbar vertebræ support a thin membranous growth which is capable of being opened and shut by means of muscles attached to the bony frame-work.

TEETH.

In describing the molars the nomenclature of H. F. Osborn will be followed. The diagram herewith presented is copied from this writer's paper in the American Naturalist, December, 1888, p. 1072.

UPPER MOLARS.

Antero-internal cusp	Protocone.	pr.
Postero-internal cusp or sixth cusp	Hypocone.	hy.
Antero-external cusp	Paracone.	pa.
Postero-external cusp	Metacone.	me.
Anterior intermediate cusp	Protoconule.	pl.
Posterior intermediate cusp	Metaconule.	ml.

LOWER MOLARS.

Antero-external cusp	Protoconid.	pr^d
Postero-external cusp	Hypoconid.	hy^d
Antero-internal cusp or fifth cusp	Paraconid.	pa^d
Intermediate or antero-internal cusp (in quadritubercular molars)	Metaconid.	me^d
Postero-internal cusp	Entoconid.	en^d

The upper molar in most bats presents to an extraordinary degree depressions on the outer or buccal surface of the crown. Such depressions receive the name of "flutings" and are seen in the teeth of many mammals other than the bats, as for example in the moles and shrews among the Insectivora, in the Ungulata, and in a marked degree in an extinct genus described by E. D. Cope, *Lambdotherium*. "Flutings," while of no homological significance, furnish systematic characters, and will therefore be noted in the descriptions. Disposed so as to define two V-shaped figures the "flutings" extend as a sinuate commissure between the paracone and the metacone. Of the two Vs an anterior and a posterior will be distinguished. Each V has two limbs, a first and a second. In the third molar various degrees of loss of the system of flutings occur. Commonly the anterior V is retained while the second is lost, excepting the buccal half of the first limb, as in *A. fuscus*, or the "fluting" is reduced to the anterior V, the palatal half of the second limb being lost, as in *Macrotus* and *Atalapha*. In the bats of North America the least reduced last molars are seen in *Nyctinomus* and *V. hesperus*.

The tritubercular tooth which results from the presence of the three cusps, the protocone, the paracone, and the metacone, may be connected with a triangular figure by bands which unite the cusp-points. These bands will be named in this monograph the *commissures*. In the molars of the bat such a triangle is seen whose apex is palatal and constituted of the protocone and whose commissure extends from this cusp to the paracone and metacone. Its base is the extraordinarily sinuate ("fluted") buccal surface of the crown. A careful search must be made for the true positions of the sides of this triangular figure, for they lie on the opposed sides of the teeth and are inconspicuous. The crown at the "flutings" is of great vertical extent and dwarfs even the proportions of the protocone. When seen in profile the proportions between the size of the "columns" of the two Vs and the "cusp" of the protocone afford materials for interesting comparisons in the different genera. The hypocone presents excellent subordinate characters. It is a development of the cingulum. Usually flat, as in *Macrotus*, it may be sharply defined as in *Promops perotis* or provided with a sharp cusp as in the exotic genus *Noctilio*. The cingulum can be traced as a delicate ridge which lies basal to the sides of the tritubercular triangle. It varies greatly in extent, being best developed in *Nyctinomus*.

In the lower molar scarcely any fluting is present and the plan of the tooth is simple. The protoconid, paraconid, and metaconid are united by commissures. The apex of the triangular figure is buccal. The heel or hypoconid is large. It is united to the triangle by a commissure at the lingual side. Such a commissure is provided with a sharp cusp in *P. perotis*, but as a rule it is smooth.

The student can not fail to be impressed with the variable form of the lateral incisor in both jaws. In the lower jaw it may be of the same character as the other teeth in its series, as in *Adelonycteris*, *Vesperugo*, and *Lasionycteris*. It may be more robust than its fellows, as in *Vespertilio*, but oftener is simpler in outline, as in *Corynorhinus*, and may be not only so, but dwarfed in all proportions, as in *Nyctinomus brasiliensis*. The next step may be anticipated, namely, its entire disappearance, as in *Nyctinomus macrotis* and in *Promops*.

These modifications suggest that the tooth has a struggle to maintain its own in the dental armature. At all events its study is one of interest, and should never be omitted in defining the characteristics of all forms whatever, either of variations, species, or genera.

The first and second premolars in both the upper and the lower jaw, and the third incisor in the lower jaw, often present a perfect cingulum. This is distinctly seen in the first premolar of *Atalapha*. Such a tooth is remarkable since, as far as I know, it is without parallel elsewhere in mammalian teeth. Various degrees of development of the buccal aspect of the cingulum appear to give rise to a cusp, which then arises *after* the outer or buccal cusp. I was led, in an early study of the human dentition, to claim that this the outer (labial) cusp of a bicuspidate form arose first and the inner (buccal) cusp arose later. I have long maintained (Dental Cosmos Phila. 1874, 617, also Studies in the Facial Region, 1874) the primitive tooth to have been monocuspidate and the subsequent forms to have been developments therefrom. But my claim has not been allowed.

An excellent view for contrasting taxonomic characters is that obtained by examining with a lens the lingual aspect of the lower molars. On the whole, the first molar yields the most trenchant characters. Three cusps are seen in profile, named, from before backward, the paraconid, metaconid, and hypoconid. The proportions of these to one another should be made in all studies of the teeth. In pteropines the three cusps are merged, and a simple convex contour results. A similar effect is produced in *Hemiderma* and *Brachyphylla* among the phyllostomines. For the most part the three cusps are separately displayed as acute triangles, whose bases are confluent. In rhinolophines the hypoconid is flat, produced backward, as is also the case in *Chœronycteris* and *Phyllonycteris* among the glossophagines, but in other genera it is acutely cusped and co-equal with the two preceding elements. In *Natalus* it is actually the largest of the series.

KEY TO GENERA.

I. Bats with median appendage to nose, four incisors in lower jaw...PHYLLOSTOMIDÆ.
  a. Body massive, auricle shorter than head, not united with its fellow..*Artibeus*.
  *a*¹. Body slender, auricle as large or longer than head, united with its fellow .... *Macrotus*.
II. Bats without median appendages to nose.
  b. Nostrils circular, wings narrow and pointed; tail long, produced far beyond interfemoral membrane; marginal toes fringed with coarse hair. MOLOSSI.
    Lips grooved..*Nyctinomus*.
    Lips not grooved...*Promops*.
  *b*¹. Nostrils elliptical, wings broad, ample; tail as long as, or slightly longer than, the broad interfemoral membrane; marginal toes naked........... .... VESPERTILIONIDÆ.
    c. Two incisors in upper jaw.
      † Six incisors in lower jaw.
        * Interfemoral membrane more or less hairy.
          Premolars $\frac{1}{2}$ ....*Dasypterus*.
          Premolars $\frac{2}{2}$ .... *Atalapha*.
        * * Interfemoral membrane not hairy ....*Nycticejus*.
      † † Four incisors in lower jaw....................................*Antrozous*.
    *c*¹. Four incisors in upper jaw.
      † Premolars $\frac{1}{2}$; greatest width of tragus at base equals one-half of inner border...*Adelonycteris*.
      † † Premolars $\frac{2}{2}$.
        * Greatest width of tragus equals much less than one-half inner border; nose simple, ears separate.............................. *Vesperugo*.
        * * Greatest width of tragus equals one-third height of inner border; auricles united.
          § Nose with lateral club-shaped gland-masses............*Corynorhinus*.
          § § Nose without lateral club-shaped gland-masses.............*Euderma*.
      † † † Premolars $\frac{2}{3}$; greatest width of tragus at middle and equals two-thirds height of inner border ....*Lasionycteris*.
      † † † † Premolars $\frac{3}{3}$. Lips whiskered, dorsum of face furred..... *Vespertilio*.

Family PHYLLOSTOMIDÆ.*

Genus **MACROTUS** Gray.*

Macrotus Gray, Proc. Zoöl. Soc. London, 1843, 21.
Otopterus Flower and Lydekker, Mammals Living and Extinct, 1891, 673.

Diagnosis.—Ears large, united, produced inferiorly far beneath the small external basal ridge; nosed-leaf simple, abruptly acuminate, complete, no separation between the basal and ascending parts; the median ridge confined to the interval between the nostrils. Tragus tapering, convex on inner border and straight on the outer. Wing membrane reaching to ankle; tail long, extending a short distance beyond the ample interfemoral membrane. Lower lip and mentum deeply cleft.

Dental formula.—Molars $\frac{3}{3}$; Premolars $\frac{2}{3}$; Canines $\frac{1}{1}$; Incisors $\frac{2}{2}$, $\times 2 = 34$.

J. E. Gray (Voy. of *Sulphur*, p. 28), places *Macrotus* in a separate division from the American leaf-nosed bats and of equal rank with the groups now understood as the Stenodermata and Vampyri. The following genera are considered by him to be closely related and are thus defined: Tail short, with point on the upper side of the wide inter-

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*PHYLLOSTOMIDÆ.—Bats with laminate ectoturbinals of the ethmoid bone; premaxillæ with palatal processes forming a median suture and defining an incisive foramen; trapezium without palmar tubercle, thus permitting flexion of the thumb; wings adapted for a fanning flight, (excepting possibly *noctilio*) but not for terrestrial progression; ulna with shaft anchylosed to the radius at the proximal third; proximal rudiment nonperforate; fifth digit without accessory cartilage; coracoid process not bifid, curved forward; no raised folds of skin at the junction of carpus and metacarpus to represent the palmar fascia; no oblique line on the wing-membrane at the lower third of the tibia; nose-leaf dominant, but absent in aberrant forms contained in Lobostomi, Noctilionini, Natalini, Thyropterini.

Mr. F. W. True has kindly furnished the following note:

Flower and Lydekker, in their recently published work—*Mammals, Living and Extinct*—substitute the name *Otopterus* for this genus, on the ground that *Macrotus*, Gray, is preoccupied by *Macrotis*, Dejean. It appears, however, that Dejean's name, which was published in his *Catalogue des Coléoptères*, 1833, p. 186, was not accompanied by a diagnosis, and has not been adopted by later writers on insects. It can not, therefore, be regarded as valid.

Quite aside from this fact, it is questionable whether *Macrotus* and *Macrotis* should be regarded technically as identical names. Agassiz gives "μαχροτης=longitudo" as the proper derivation of the latter (as also of his genus *Macrota*). This is interesting, as Reid in 1836 (P. Z. S., p. 131) gave the name *Macrotis* to *Perameles lagotis* (now called *Peragale lagotis*). If the difference in the termination of the two words is to be disregarded, Gray's name is preoccupied by that of Reid. This, as already stated, seems open to question, and Gray's name is, therefore, retained.

femoral membrane; ears lateral, separate. *Mosia*, *Mystacina*, *Aello*, *Emballonura*, *Centronycteris*, *Urocryptus*, *Diclidurus*, *Taphozous*, *Noctilio*, *Phyllodia*, *Chilonycteris*, and *Mormops* are embraced in this oddly-arranged group. In the same work, p. 16, the author places *Macrotus* near *Megaderma* and *Rhinopoma* as a subgroup of the Phyllostomina: "Ears close together over the forehead; forehead with a rather deep pit: nose-leaf lanceolate, erect; tail elongate, produced beyond the interfemoral membrane; wings from the ankle: lower joint of thumb moderate."

Wagner was of the opinion last named, that *Macrotus* exhibits affinities with *Megaderma*. S. F. Baird followed this writer, and I naturally accepted this opinion,* since my work was carried on under the guidance of the eminent authority last named. Peters, in his revision of the Phyllostomidæ,† definitely fixed the position of the genus.

Macrotus resembles *Lonchorhina* in the elevation of the nasal bones and in the depression on the facial portion of the frontal bone, as well as in the elevation of the skull at the vertex near the occiput and in the large size of the tympanic bone. From *Lophostoma* it is easily distinguished by the absence of the temporal crest, which is so conspicuous in this genus, and by the form of the zygoma, which is high and of uniform diameter throughout. The frontal bone is without a depression in the facial portion, and the nasal bones do not form a ridge, while the dorsi-facial surface is cylindroid. *Phyllostoma* is distinguished in having a small lachrymal process and a flat, broad, dorsi-facial surface. The temporal crest is defined, though not conspicuous. The zygoma is of the same character as in *Macrotus*. The tympanic bone is much smaller than in this genus. In a fragment of an immature skull of *Vampyrus auritus* the skull is without temporal crest, the dorsi-facial surface is cylindroid and without depression on the frontal bone.

1. **Macrotus californicus** Baird. (Plates I, II.)

Macrotus californicus Baird, Proc. Acad. Nat. Sci. Phila., 1858, 117. *Ib.*, Rep. U. S. and Mexican Boundary Survey, pt. 2 (Mammals), 1859, 4, Pl. 1, Fig. 2.
Macrotus waterhousii (in part), Dobson, Cat. Chirop. Brit. Mus., 1878; Alston, Biol. Centrali-Amer., Mam., 1879-'82, 38.

Diagnosis.—Auricle much longer than head. Basal lobes well developed. Nose-leaf with defined lower border. Fur (above and below) base, white; terminal third, fawn; tip, gray.

Description.—The auricle is ovate and longer than the head. The internal basal lobe is rounded and free, raised above the head and resting against the interauricular membrane. The external basal lobe is large, the greatest width equal to the distance between the eye and end of the muzzle. A prominent wart, which lies above the rictus,‡ terminates the lobe anteriorly. Two longitudinal ridges are seen on the inner

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[*] Monograph N. A. Bats, 1864.

d. Berlin, 1865, p. 256.

ll be used as a term interchangeable with *angle of the mouth*.

surface, one small and inconspicuous at junction of internal basal lobe to the main portion of the auricle; a second, much longer, arises behind the tragus and passes upward nearly to the tip. The auricle anterior to the ridge last named is sparsely covered with hair. Numerous delicate transverse folds are seen on the outer half of the auricle, which reach almost to the border. Nearly on a line with the junction of the external basal lobe and the main portion and opposite to the meatus a semilunar raised fold is seen.

The interauricular membrane is notched above, hairy on the outer surface, and with a longitudinal ridge in young individuals in the middle line. The membrane extends beyond the inner canthus of the eye, at which point it bears a small wart. The tragus is long, slender, and tapering; when laid forward it reaches to the inner canthus. The posterior surface is furnished with a longitudinal ridge. The base exhibits two roots, one extending a short distance obliquely on the face; the other continuous with the ridge opposite to the meatus. The tragus is slightly constricted above the facial root, but soon becomes convex along the inner border. The outer border is straight, excepting at the base. Here the parts are variable. In the greater number of specimens examined a trace only of an external basal lobe is seen.[*] The nose-leaf is simple, entire, rounded at the muzzle and fixed to the upper lip, while free at the sides. The erect portion tapers acutely, and is sparsely covered with hair. A rudiment of a midrib is seen between the nostrils. The nostrils are oblong, oblique, with raised trenchant borders. They are slightly narrowed externally and do not modify the lateral contour of the nose-leaf. A crescentic patch of warts lies on the face back of the muzzle. Two small, slightly oblique, smooth mental plates, separated by a groove, are seen at the chin. Well back of the chin-plates is a conspicuous median wart. The rictus is on a line with the inner canthus. The wing membranes are attached to the epitrochlea.[†] The fifth metacarpal bone is the longest.

The prevailing color of the fur is white. On the dorsum for the apical fifth it is light brown, fawn, or yellow brown. Frequently the extreme tip is gray. On the venter the basal half of the hair is alone white, the apical half being ashy-brown, the extreme tip again appearing white or plumbeous. The face retains the color of the venter without the basal white. The side of the neck and the base of the prebrach-

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[*] In a young individual (8916, S. I., the epiphyses not united, and the length of the body 44^{mm}) the external basal lobe was thick and acutely concave on the outer border. It was obscurely verrucose and received by a delicate fold the outer border of the tragus upon its anterior surface. A thickened longitudinal swelling was seen on the posterior surface near the inner border. In a second immature specimen (42^{mm} long, the milk teeth being in position) the tragus was more as in adult.

[†] In an immature specimen, No. 4405, Mus. Comp. Zoöl., the membrane came from the epicondyle.

Variations.—The distance between the tail and the tip of the calcar is inconstant. The sides of the interfemoral membrane do not always end at precisely the same level on the tail.

The basal part of the nose-leaf may be separated from the ascending part by a sulcus in the manner seen in *Artibeus* and *Phyllostoma.* The lower margin may be separated from the groove to the outer side of the lateral margin.

Manal formula.

	Adult 50^{mm} long.	Immature 44^{mm} long.
Second interspace	3	2
Third interspace	20	13
Fourth interspace	25	18
Forearm	27	44

Skull.—The brain case is raised much above the level of the face. The sagittal crest is defined, except on the metencephalon, where, excepting at the extreme tip of the angle between the vertex and the occiput, it is absent. No convexity exists over the region of the proencephalon, which measures one-eighth of the length of the brain case. The region of the metencephalon measures one-third of the length of the brain case. The tympanic bone is large, almost entirely concealing the cochlea. The basi-occipital bone is without lateral fossæ. The lingual process of the sphenoid bone is rudimentary or absent. The posterior temporal impression is deflected from the sagittal line at metencephalon to define with the aid of the fellow of the opposite side a large, triangular, convex space. The face vertex is markedly inflated at the side for the greater part of its length; a median ridge extends over the anterior two-thirds, the posterior thirds being depressed; on each side of the median line a small foramen, which transmits a nerve to the auricle, is seen. On the side the inflation occupies the greater part of the superior maxilla and causes the region of the infraorbital foramen to be slightly depressed. The anterior border of the orbit is trenchant. The ectoturbinal plates show through the frontal bone as it forms the orbital inner wall; a small foramen is seen near the rhinencephalon lying below an oblique ridge. The upper border of the malar bone is incised at the middle third. A line produced from the upper border of the anterior nasal aperture intersects the middle of the first upper premolar. The inner surface of the ascending ramus of the lower jaw is furnished with a ridge which extends forward on a line with the teeth. The condyle end reaches the aveolus. The angle is narrowed, curved, and tapering at the tip; it projects posteriorly beyond the condyle to the outer third of which it lies as the bone is viewed from above. The distance from the condyle to the tip of the corenoid is equal to the width of the horizontal ramus.

The cochlea in the Phyllostomidæ, as a rule, exhibits the loop of the outer semicircular canal free from bone. In *Macrotus* this character is less constant than in other genera examined, for out of three examples one showed the loop occupied with a thin, bony lamina.

	Millimeters.
Length of skull	23
Width of skull at the widest part	9
Width of dorsi-facial region at the widest part	5
Length of superior dental series	9
Width of base at the glenoid cavities	11

In the skull of an immature individual from the Museum of Comparative Zoölogy, measuring 21^{mm} from end of the premaxilla to the occiput, the following characters are noted: The mandible projects 2^{mm} beyond the premaxillæ. The premaxillæ do not join the nasals, which are twice as wide at the posterior ends than at the anterior. The tympanic bones are complete.

The arrangement of the turbinal plates is as follows: The ectoturbinal is small, a little less than one-half the length of the first endoturbinal. Its upper border is horizontal and its lower concave. The extreme tip of the lobule extends as far as the anterior border of the first molar. The second plâte is concealed and the third and fourth are arranged much as in *Vampyrops*, which this form in great part resembles. The lobule on the first endoturbinal is small, but readily discernible. The plates below their inflated summits are not clearly seen. The parts on the median surface are contiguous.

Notes on the skeleton.—The atlas is provided with two spines on the inferior border of the transverse process and a tubercle on the body. The meso-sternum is provided with a trenchant unbroken keel. The ulnar rudiment at the distal end of the radius is a minute tubercle without notch or foramen; the proximal rudiment is a little less than half the length of the radius. The vertebral border of the scapula is sigmoid with the concavity corresponding to the base of the spine. The infra spinatus fossa is not deepened at the axillary border. The end of the spine at the glenoid cavity end is not angulated. The coracoid process is abruptly curved toward the axillary border; the end reaches a point below the glenoid cavity. The inner tuberosity of the humerus is scarcely elevated above the level of the head. A narrow notch is defined between the epitrochlea and the trochlea, the under border of the epitrochlea is furnishèd with a spine.

The first metacarpal bone equals one-half the length of the first phalanx of the first digit, the second lacks one-fifth the length of the third metacarpal bone and is slightly arched. The second digit is as long as the third metacarpal bone. The third and fifth metacarpal bones are of equal length and are not as long as the forearm. The fourth is 2^{mm}. shorter. The third metacarpal bone is much the stoutest, the second phalanx is slightly the longer. In repose the first phalanx of the third digit is in axial line with the third metacarapl bone. The fourth and fifth digits are of the same length. The f brought nearly to the median line posteriorly, where they lie almost in contact.*

Maxillary teeth.—Central incisor much larger than the lateral, contiguous with its fellow with sharp transverse cutting edge. The lateral incisor very small, crown directed obliquely forward and inward with an obscurely bilobed cutting edge. Canine rather small not twice the length of the central incisor; the first premolar as broad as the second but less abruptly pointed and touching canine. The second premolar with wide base where it rests against the first molar. An interval exists between the two teeth. The first molar slightly inclined backward with low protocone and obscure commissures, the posterior being in great part absent. Paracone forming a smaller V than the metacone but is more fluted than it. Hypocone obscure, low. The second molar more quadrate than the first; the protocone somewhat better defined. The Vs of the buccal cusps equal but the protocone is tumid at an angle formed by it with the anterior border of the crown. The third molar with protocone having well defined commissures. The posterior limb of the paracone but half the length of the anterior limb. The remaining parts of the tooth not represented.

Mandibular teeth.—Incisors simple, even, obscurely bilobed. First premolar higher and broader (in profile) than the second and third. This distinction is not so apparent when the parts are viewed from above. The second and third premolars are progressively more pointed and lower than is the foregoing.

The first molar with the V much smaller than the triangular heel whose anterior limb juts against the posterior limb of the V near its base (perhaps, on the whole, to a less degree than is represented in the figure). The base (*i. e.*, the lingual aspect) of the V is open, but that of the heel is closed by a depressed commissure. The second molar much the same as the foregoing, the V and heel being subequal. The third molar with the largest V in the series but with a small, compressed, deflected tubercle like heel.

Paraconid in first lower molar smallest of any in the series. The conjoined bases of the paraconid and metaconid deeply incised so as to show the protoconid when the tooth is seen in profile on lingual aspect. This character is not seen outside of this group, but reaches a higher degree of development in *Ischnoglossa*.

List of specimens.

Cat. No.	Specimens.	Locality.	Sex.	Presented by—	Nature of specimen.	Collection.
2347	1	Fort Yuma, Cal		Maj. G. H. Thomas	Alcohol (type)	U.S.Nat.Mus.
3214	28	Cape St. Lucas		John Xantus	Alcohol	Do.
6174	1	do		do	do	Do.
11306	5	do	♀, 1♂		do	Do.
8816	1	Near Tucson	♂ imm.		do	Do.
6271		No locality	♀		do	Do.

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* For other comments on the skeleton of *Macrotus*, see Introduction.

Dobson (*l. c.*) considers *M. californicus*, Baird, to be the same as *M. waterhousii*, Gray. Specimens of the latter are not available for examination. Bats of the Antilles may range north and west through the neotropical belts of the United States, but *M. waterhousii* does not appear to be an example of the tendency. By the measurements taken by Mr. Dobson this species appears to possess a smaller tail and a shorter appendage to the nose than does *M. californicus*. Among other measurements (English scale) of West Indian species are the following: head, 1^{m}; body, 2.60^{m}; tail, 1.50^{m}; ear, 1.10^{m}; tragus, 0.42^{m}; nose-leaf, 0.30^{m}; wing from carpus, 0.3^{m}; forearm, 0.2^{m}.

On the whole, I have concluded not to make any change in the name of the Californian species of *Macrotus*, and shall rest content to quote from the first edition of the Monograph (pp 3, 4) the following passages:

> A comparison of the type with good specimens of the latter from Cuba, preserved in alcohol, and presented by Prof. Poey to the Smithsonian Institution, show unmistakable differences, as do others from Jamaica, recently received from Mr. March.
>
> The chin plates are less acutely defined; the internal border of the tragus is much thickened, and the revoluted portion at the base of the external border is slightly swollen. The fur is bicolored; central portion dark-brown instead of fawn. The nose-leaf is of about the same height as above species; the tail, however, is 0.25 of an inch shorter. The dentation is similar.
>
> The *M. mexicana*, Saussure, is a species from Mexico described by M. Saussure in Revue et Mag. de Zool., 2d series, XII, 1860, p. 486. The author states that the description is taken from a specimen which was in poor condition. It is difficult to tell from his description whether his species is the same as *M. californicus* or not.

Measurements of an average of four individuals.

	Millimeters.
Length of head and body (from crown of head to base of tail)	39
Length of head	22
Height of ear	23
Height of tragus	10
Length of arm	22
Length of forearm	48
First digit:	
Length of first metacarpal bone	4
Length of first phalanx	4
Second digit:	
Length of second metacarpal bone	28
Length of first phalanx	4¼
Third digit:	
Length of third metacarpal bone	34
Length of first phalanx	14
Length of second phalanx	16
Length of third phalanx	9
Fourth digit:	
Length of fourth metacarpal bone	32
Length of first phalanx	13
Length of second phalanx	11

	Millimeters.
Fifth digit:	
Length of fifth metacarpal bone	35
Length of first phalanx	12
Length of second phalanx	9
Length of thigh	16
Length of tibia	20
Length of foot	10
Length of tail	27

Measurements from first edition of Monograph. *

Current number.	From tip of nose to tail.	Length of tail.	Height of nose-leaf.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	Ins.	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	
2347	2.3	1.6	0.2	1.10	0.9	3.3	0.5	1.1	0.5	10.0	Alcohol.
5214	2.0	1.3	0.2	1.8	0.8	3.0	0.5	1.0	0.4½	10.0	Do.
5214*a*	2.0	1.4	0.2	1.10	0.10	3.2	0.4	1.2	0.5	10.0	Do.
5214*b*	2.0	1.3	0.2	2.0	0.10	3.0	0.5	1.0	0.4½	10.0	Do.
5214*c*	2.0	1.2	0.2	2.0	0.8	3.0	0.5	1.0	0.5	11.0	Do.
5214*d*	2.0	1.4	0.2	1.8	0.10	3.0	0.5	0.11	0.4	10.6	Do.
5214*e*	2.0	1.4	0.2	1.9	0.9	3.0	0.5	1.0	0.6	11.0	Do.
6174	2.0	1.3	0.2	1.8	0.8	3.0	0.5	1.0	0.5	10.6	Do.

Macrotus bulleri **H. Allen.**—The following description of a Mexican species of *Macrotus* may prove to be of value in studying *M. californicus*, and is therefore introduced at this place. The original can be found in the proceedings of the American Philosophical Society, 1890, Vol. XXVIII, p. 72.

In Article XVI, extracted from the Bulletin of the American Museum of Natural History, Vol. II, No. 3, p. 166, entitled "Notes on a collection of Mammals from Southern Mexico," by Dr. J. A. Allen, occurs the following statement:

> ***Macrotus californicus***, Baird.—Eight skins and skulls and three additional skulls, all males. Bolanos, Jalisco, July 3, 1889. "Occurs in immense numbers in the adits and old mine drifts of the Mineral de Bolanes. Of the fourteen captured all were males, whereas in the case of the other kinds of bats taken here females generally predominate." (Audley Buller, MS. notes.)
>
> In the absence of specimens for comparison, it is difficult to say certainly whether they are the same as the California specimens. Judging by descriptions, they are somewhat darker in color.

I had an opportunity through the courtesy of Dr. Allen of examining two of the specimens of this series, and concurred with this authority in considering them to be identical with *M. californicus*. The skins were of immature individuals and the parts about the auricle apparently mutilated. The hair was furnished with dark cinereous tips, a character which, while in striking contrast with the more northern form of the species, was not thought to be distinctive for southern examples of other species, as *Artibeus perspicillatus* and *Atalapha noveboracensis* are differently colored from northern individuals. The main measurements were the same. But since Dr. Allen published his notes I have carefully soaked one of the skins in diluted spirits and have detected that the apparent mutilations of the auricle are due to distortion, and that the form of the auricle is sufficiently pronounced to warrant a careful examination of the cranium.

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* See Preface.

Dr. Allen has sent to me eight crania for inspection. The characters of these specimens are in many respects quite different from those of *M. californicus.* The following is the description of this new species:

Auricle scarcely longer than head; the internal basal lobule rudimental and projects about a millimeter beyond the juncture of the interauricular membrane. External basal lobe reduced to a thin ridge which leaves the tragus exposed. Tragus with convex anterior border for basal two-thirds, and an abruptly acuminate apical third. The outer border is straight—apparently without basal notch or lobule.

The nose-leaf without well-defined lower border—scarcely longer than the face. Chin apparently without divided plate.

Skull.—Facial region without depression on the frontal bone; indeed, it is faintly ridged posteriorly; region over ethmoid scrolls scarcely inflated. Squamosal portion of zygoma not more than one-half the size of the same part in *M. californicus.* No projection of vertex at occiput, but the entire superior curvature of the head simple. Angle of mandible projects scarcely at all back of the condyloid surface. The two halves of the mandible closer together than in *M. californicus.*

Teeth.—The lower premolars are more crowded than in *M. californicus.* The palatal portion of the upper canine is produced to a point posterior to the lateral incisor.

Fur.—On the back the basal two-third is white, the apical third very dark plumbeous, the tip tending to gray. These distinctions are best defined on the sides of the neck. At the middle of the back the gray tip is absent. The colors undergo no variation over the posterior surface of the prebrachium, the humerus, or the rump. On the endopatagium the hairs are shorter, sparsely developed, and of a fawn color throughout.

On the venter a disposition exists for the basal two-thirds of the hair to be whiter than the rest of the hair. This is most marked on the sides of the trunk, and is nearly absent at the middle. The apical third is less markedly plumbeous and the tip is more gray than on the back. On the whole the venter gives the impression of being gray, and the back as being of a dark, sooty hue.

The posterior surface of the auricle covered with short unicolored gray hair which extends upward along the median border nearly its entire length. The hair extends both on the back and the venter over the fleshy part of the forearm.

Two immature examples (the distal epiphyses of the metacarpal bones of the third, a fourth, a fifth, manal digits ununited) 2004, 2005 (Am. Mus., N. Y.), from Bolanos, Jalisco, Mexico.

Measurements.

	Millimeters.
Height of auricle from vertex	7
Height of tragus (slightly distorted)	6
Height of nose-leaf	7
Length of forearm	44
First digit:	
Metacarpal	4
First phalanx	4
Second phalanx	2
Second digit:	
Metacarpal	45
First phalanx	5
Third digit:	
Metacarpal	32
First phalanx	15
Second phalanx	15
Third phalanx	9
Fourth digit:	
Metacarpal	31
First phalanx	14
Second phalanx	11
Fifth digit:	
Metacarpal	33
First phalanx	14
Second phalanx	10
Length of femur	15
Length of tibia	16
Length of foot	13
Length of tail	25
Length of free portion of tail	3½

Genus **ARTIBEUS** Leach.

Artibeus Leach, Trans. Linn. Soc., London (1822), xiii, 75; Peters, MB. Akad. Berlin, 1865, 356; Alston, Biol. Centrali-Amer., Mam., 1879–'82, 47.

Madataeus Leach, l. c., 81.

Arctibeus Gray, Mag. Zoöl. and Bot., 1839, II, 487.

Pteroderma Gervais, Exped. du Comte de Castelnau, Zoöl., 1855, 34.

1. **Artibeus perspicillatus** (Linnæus). (Plates III, IV, V.)

Vespertilio perspicillatus Linnæus, Syst. Nat., 7th ed., 47; Schreber, Saügethiere, 1775, p. 160, Pl. XLVI.

Phyllostoma perspicillatum Geoffroy, Ann. du Museum, XV, 1810, 176, Pl. XI; Wagner, Schreb. Saügeth., Suppl., I, 1844, 402; V, 1855, 631.

Artibeus jamaicensis Leach, Trans. Linn. Soc. London, XIII, 1822, 75.

Madataeus lewisii Leach, l. c. p. 82.

Phyllostoma supercillatum Wied, Beitr. zur Naturgesch. Brasil. II, 1826, 200.

Arctibeus perspicillatus Gray, Mag. Zoöl. and Bof., 1839, 487.

Artibeus carpolegus Gosse, A Naturalist's Sojourn in Jamaica, 1851, 151.

Pterderma perspicillatum Gervais, Exped. du Comte de Castelnau, Zoologie, 1855, 34, Pl. VIII, Fig. 7; Pl. X, Fig. 1 (teeth).

Artibeus perspicillatus, Peters, MB., Akad. Berlin, 1865, p. 356; (1) Maynard, Bull. Essex Inst., 1872, 137; Dobson Cat. Chirop. Brit. Mus., 1878, 519; Alston, Biolog. Centrali-Amer., Mam., 1879-'82, 47.[*]

Artibeus is intermediate between *Uroderma* and *Dermanura* and the three genera are in close alliance. Peripheral characters such as those of the auricle and nose-leaf are of doubtful value. The small third lower molar separates *Artibeus* from *Dermanura*, as the absence of the third upper molar separates it from *Uroderma*.

All of the three genera named can be distinguished from *Vampyrops* by the shape of the first lower molar. In *Vampyrops* the protoconid is greatly elevated, while the anterior border of the tooth is not prolonged.

Diagnosis.—Nose-leaf smooth, with entire margins and a broad longitudinal ridge, which is discernible on both anterior and posterior surfaces; lower portion, as a rule, not free at any part from the upper lip. Infra marginal tubercles at the mentum more than three in number.[†] Mentum provided with a large central wart, on either side of which is placed a smaller wart; the whole arrangement is surrounded by a semicircular row of nodules. Interfemoral membrane scanty, deeply emarginate, without tail.

Molars broad without Vs and exhibit a disposition to become cuspidate on outer and inner borders. Upper middle incisor broad and straight.

Dental Formula.—Molars $\frac{2}{3}$; premolars $\frac{2}{2}$; canines $\frac{1}{1}$. incisors $\frac{2}{2} \times 2 = 30$.

Description.—General form massive; the body heavy; the head with broad transverse diameter. Auricles small, separate. Each auricle when laid against the face reaches the external canthus. The inner border is markedly convex and continued in a single curve with the broad internal basal lobe. The outer border is straight, with a number of transverse lines on conch. The hem is one-third the width of the auricle at its broadest part and is continuous below with the rounded broad external basal lobe. A conspicuous external basal ridge is present. The tragus in height equals the distance from the tragus to the eye. It is erect, slightly convex on inner border, almost straight in the inner, and thickened along the median surface, which is usually coarsely spinose inferiorly. The basal notch broad, with a spine at the upper border the basal lobe. A fold of skin extends obliquely from the base to the face. The nostrils are oval and placed obliquely upward and outward. The ends of the opening are free, but the sides are remarkably foliated. The nose-leaf is thus divided by the nostrils into an upper supra narial and a lower infra narial portion. Both of

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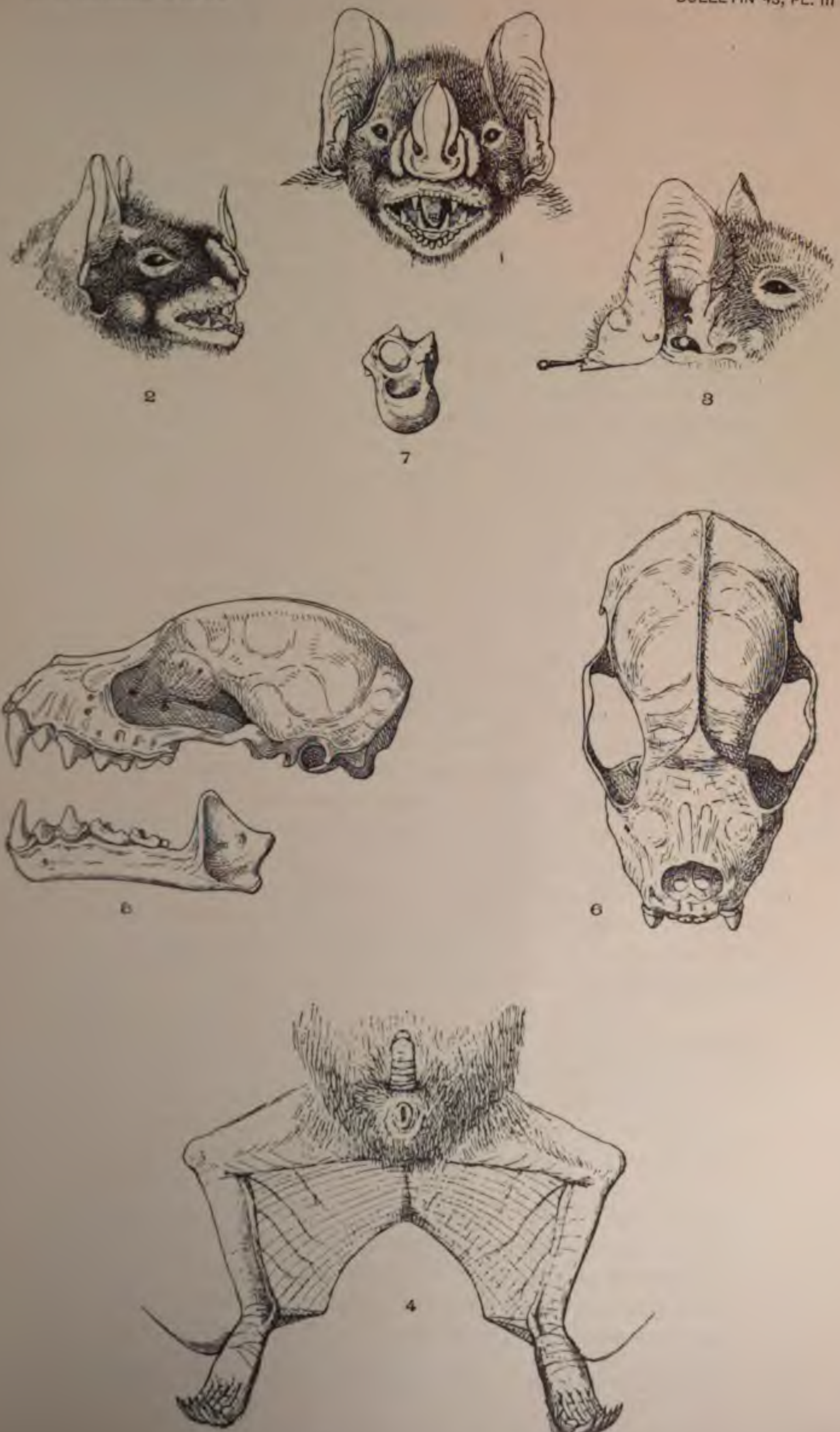
[*] The synonomy in part has been copied from Dobson's Catalogue of the Chiroptera in the British Museum.

[†] In two specimens of *Dermanura cinerea* examined, the sides of the nose-leaf were concave, the posterior surface of the nose-leaf was without trace of longitudinal ridge, and the infra-marginal tubercles were three in number.

EXPLANATION OF PLATE III.

FIG. 1. Front view of head of *Artibeus perspicillatus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. The interfemoral membrane.
FIG. 5. The skull and the lower jaw seen from the side. x 2.
FIG. 6. The skull seen from above. x 2.
FIG. 7. The os petrosa. x 4.



ARTIBEUS PERSPICILLATUS.

these are vertically disposed—the latter lying in advance of the former. The upper nostril-border is obliquely disposed to form a fleshy band which widens to form the lateral margin of the naked, erect nose-leaf. These margins tend to unite at the posterior surface of the tip of the mid-rib. Lying between the nostrils is a tubercle; above this is a broadly ovate, convex mid-rib. A similiar mid-rib is seen on the posterior surface. This "fer de lance" is spoken of in general zoological writings as the erect part of the nose-leaf. The infra-narial outgrowth is disposed laterally. It also is naked, conforms to the large, crescentic mass of muzzle-glands, and is coarsely sinuate on its free margin. It unites with the posterior surface of the supra-narial portion at the point where this leaflet frees itself from the head. Below it unites with the fellow of the opposite side across the muzzle by a row of obscure nodules which may form a ridge. A few hair-bearing warts lie in the space between the muzzle-glands and the eye. The upper lip is bordered throughout with marginal papillæ; the lower lip is free from the mandible its entire length, and furnished with papillæ at the sides only. Near the mentum the papillæ become coarser, and in front of the incisors form a distinct row which is arranged in the form of a semicircle round a distinct, undivided chin plate. The eye is large and conspicuous. The calcar is short, about the length of tarsus; tail none.

Variations.—The lobe at the free margin of the basal portion of the nose-leaf may be conspicuous or almost absent; a faintly marked crescent of minute warts may lie on either side of the upper lip, in some specimens the basal part may be without tubercle. The external basal lobe of the tragus may be nearly quadrate. The spines on the outer border of the tragus proper are subject to much minor variation.

Coloration.—The color of the hair of this species is subject to great variation,* a circumstance which probably accounts for the number of species which have been proposed. The material at hand has not been sufficient to satisfactorily determine the ranges of variation. I will rest satisfied in defining some of the more marked characteristic types of coloration.

The prevalent shades, however, are not very broadly differentiated. Fawn, deep sienna brown, mouse-gray with various shades of ashy white tips to the hairs, being the prevalent hues. The degree to which the hair is unicolored or bicolored is also inconstant. Unfortunately the exact localities from which material has been collected in many instances are not known.

In the specimen No. 11187 N. M., Mirador, Mexico, the fur of the crown was white; the longitudinal streaks usually present in *Artibeus* were apparently absent, but in reality they formed the lateral boundaries of the crown. The occiput and back were of a light-gray brown at tip, while the main portion of the hair much lighter. Over the sacrum the hair was almost white without brown tips. The face was provided with light-brown hair verging to white. The inter-ramal space was white; so also was the front of the neck. The same color extended over the middle of chest. The rest of chest and abdomen was of a light shade of fawn, with ashy tips to the hair. The fur was slightly thinner over the front of the trunk than at the sides. The side of the neck was of the prevalent color of the back. On each side the lower part was covered with white tips to the hair, thus simulating shoulder tufts.

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*Dr. J. A. Allen (Bull. Am. Mus., 1891) enters into a careful comparison of this species from the West Indies, Bolivia, and Bogota.

No. 5206, N. M., from Cuba, showed the same coloration as above, excepting that the crown was brown and the lateral stripes were scarcely discernible.

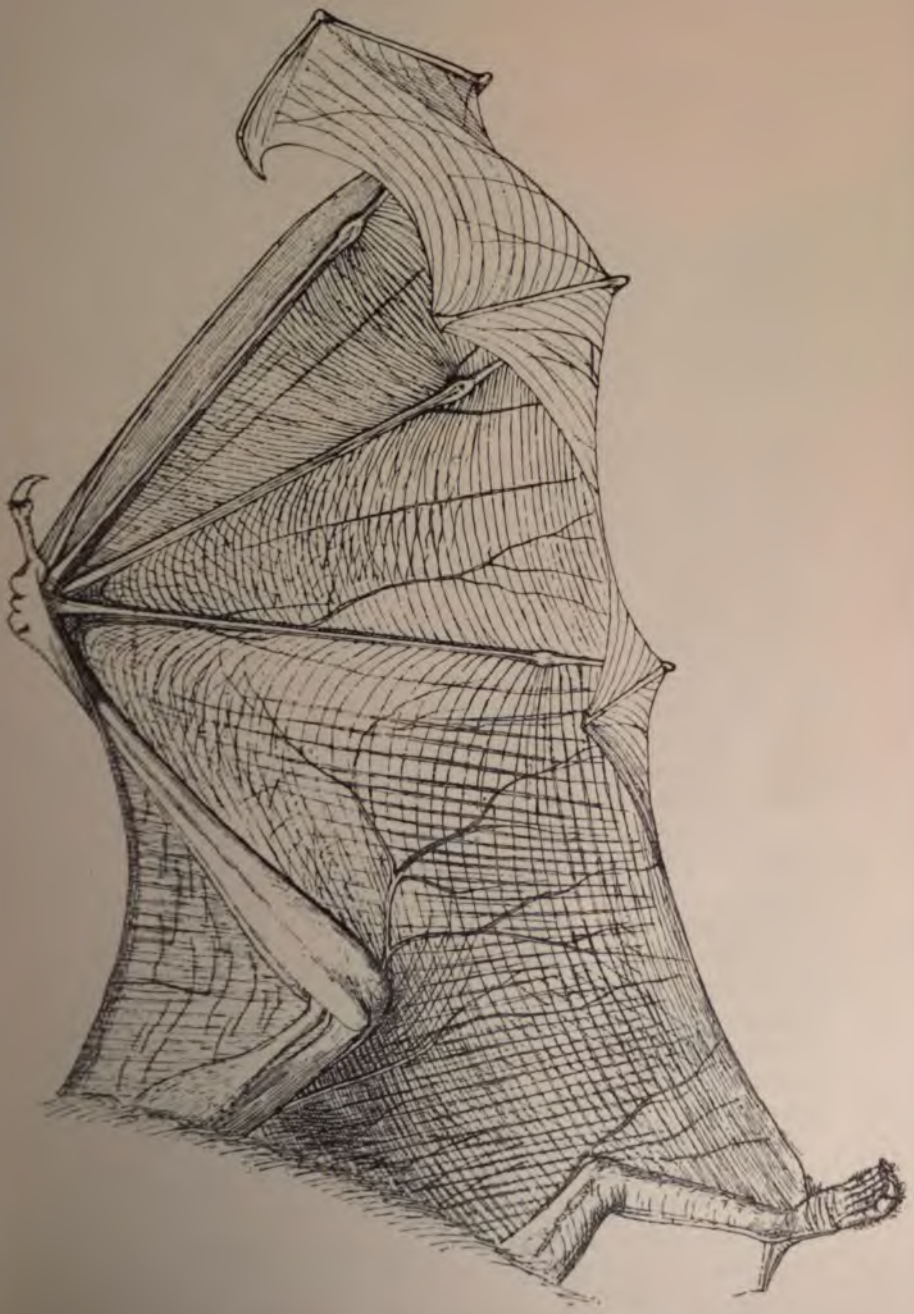
In the second example the color was the same as above, excepting the fur was less white on the back. The crown was of a brown color and the two lateral stripes were distinct. The region of the sacrum was also brown in color.

In specimen No. 13320 N. M., the fur was everywhere of a rich sienna brown, and was unicolored. The lateral stripes on the head were distinct. A small linear tuft extended from the base of the tragus to the external canthus. A long fringe of hair laid in front of the auricle.

In a third individual a few sparsely distributed hairs were seen on the venter of the antebrachium, a distinct row projecting over the free margin. The dorsum of the forearm from near the elbow to the middle was covered with a sparse growth of short hair, which was directed downward and backward. The venter of the forearm exhibited a similar disposition; the hair was confined to the fleshy portion. The dorsum of the first metacarpal bone was occupied by a few hairs. The dorsum of the endopataguim was covered with hair in the angle between the lower border of the thorax and the arm near the elbow. On the venter it extended as a thin layer from the lower end of the biceps to near the upper third of the thigh.

Prof. B. G. Wilder, of Cornell University, kindly sent me for examination a specimen, which bore a general resemblance to those from the National Museum. No hair, however, was on the forearm or on the dorsum. The hair over the ventral aspect of biceps muscle and along the side of the trunk to the pubis was much darker than elsewhere, and was of a ashy brown color. On the dorsum of the head the color was white; thus the linear streaks were apparently lost. The chest and loin were of a light brown at the tip, yellow brown in the middle, two-fourths and plumbeous at the basal fourth.

A second example from the same source showed the color to be a general dark brown; the stripes were well defined; a white patch was seen at the base of each auricle posteriorly; the back was provided with a long lustrous brown hair, unicolored for the most part, but showing paler shafts over the scapulæ. Below the fur was much darker than



WING MEMBRANE OF ARTIBEUS PERSPICILLATUS.

above, and unicolored save at the tips, which is distinctly cinerous. The fleshy part of the forearm was covered with hair, which was directed toward the elbow. The dorsal surface of the first metacarpal bone was marked with a small clump of hair.

In two specimens collected by the expedition of the Philadelphia Academy of Natural Sciences at Uxmal, Yucatan, in 1889, the general appearance of the venter was mouse-gray beneath, with silvery tips to the hair, and that of the dorsum was darker and without gray, except the two faint stripes on the head. The head and neck were for the greater part white, the tip alone being ash gray. The white lines on the head were inconspicuous. On the side of the neck the hair was of the above type, but much longer. The front of the neck was nearly unicolored, the basal one-fifth alone being white. The dorsum was dark lustrous and uncolored at the loin. The venter was provided with distinctly ashy appearance of the tips, but the rest of the fur was ash brown.

Membranes.—The prebrachium with free margin occupied with a band 1^{mm} wide, which apparently represents the tendon of the occipito-pollicis muscle; intercostal markings conspicuous, four in number; the lowest is the largest and extends as far as the ankle. The oblique line, which passes upward and outward as far as the ankle on the mesopatagium in many genera, is here absent. The line of the fascicle of the coraco-brachialis is conspicuous and extends to a point in a vertical line with the elbow. The lines of the vertical platysma fascicles are about thirty in number. The system into which the triceps-fascicle enters extends as far as the end of the fifth digit. It is composed of three divisions, a vertical, oblique, and a horizontal. The fourth interspace is provided with a faintly marked longitudinal line, which begins at a point 22^{mm} from carpus and extends to a point 10^{mm} from the free margin of the membrane. The predigital nerve appears at the middle of the fifth metacarpal bone, and is larger than the post digital, which appears at the metacarpo-phalangeal joint of the third finger. The third interspace is also provided with a longitudinal line. It extends from near the palm and reaches to within 10^{mm} of the free margin of the membrane. A nerve appears at the metacarpo-phalangeal joint of the fourth finger and lies obliquely across the lower part of the interspace. The fourth phalanx of the third digit is sickle shaped, the membrane being to its tip; that of the fourth digit is of the shape of an inverted T; that of the fifth is triangular, the angle, which is directed toward the body, being prolonged.

Skull.—The skull is massive, broad, as compared with other crania in the order. Concave muscular impressions are defined in the region directly back of the temporal bone. The mastoid process is longer than the paroccipital. The tympanic bone is complete above, though the suture between the two parts is conspicuous. The bone is small as compared with the same part in other genera; it recedes slightly from the free border of the squama, and as seen from below leaves the cochlea [illegible] a distance slightly in excess of its own width. The sphe-[illegible] is not deflected from the level of the basisphenoid. The [illegible] foramen, as a rule, is doubled. The posterior border of [illegible] almost on a level with the posterior edge of the hard [illegible]. The angle of the mandible is slightly deflected outward. The [illegible], as seen in the orbit, is exceedingly small and in some [illegible] apparently absent. In large specimens a rudiment of the [illegible] process is present and the anterior border of the temporal [illegible].

[illegible] without median depression.* The shape of the zygoma [illegible] considerable variation: the depth of the notch on the upper [illegible] the height of the arch midway between the maxillary [illegible] processes being inconstant proportions. The styloid pro-[illegible] of great length and projects into the substance of the [illegible]. From an average of measurements of three specimens, the [illegible] secured:

[illegible] length of superior dental series 11mm; outside measurement [illegible] width of the dental arch at the first upper molar 13mm; [illegible] the cranium at the glenoid region 15mm; the length [illegible] from the postorbital processes 9mm; the length of the [illegible]; the height of the coronoid process 3mm.

The arrangement of the turbinals in *Artibeus* is as follows: The [illegible] exceedingly slender and is furnished with a fleshy sum-[illegible] outward. Its upper portion alone is seen from [illegible]. The first endoturbinal is free below but fleshy [illegible] forward one-half its length beyond the end of [illegible] acuminate, and possesses, as [illegible]. The second endoturbinal is con-[illegible]. When [illegible] pressed aside at its upper part [illegible] second plate is seen in position. [illegible] possesses a large lobule, which lies upon the [illegible] form, completely occu-[illegible] appears to arise from the [illegible] presents an exposed [illegible] the convex nonperforate [illegible], which is turned outward. [illegible] plate the absence of [illegible] seem to show that the [illegible] departed from.

[illegible]. No. 1 measured 14 [illegible]. Maxilla articulates with the nasal at the upper fifth of its outer border, the remaining four-fifths being occupied with the premaxilla. The nasals twice the width above as below, where the free margin is oblique from within outward so that an inverted △-shaped space is defined between them. The frontals separated by a sharply limited median suture; the encranial and facial region in the orbit defined; a fronto-squamosal suture evident: An intermediate osside to the squamosal and opisthotic elements is seen at the side of the cranium. The basioccipital and exoccipitals unite as in mammalia generally. The part first named is tilted upward, thus forming the wall of a deep basicranial depression. The proportions of the tympanic bone and cochlea are as in the adult. The permanent central upper incisors are alone erupted. Five hook-like deciduous teeth are visible. They may be named two incisors, one canine and two premolars. All the permanent lower incisors are erupted. The only hook-like deciduous tooth is one in the position of the canine. The premolars and molars are near the surface of the gum and can be obscurely outlined.

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* [illegible] characterized by this nega-[illegible] seen on the dorsum of the [illegible] similarity enables the [illegible] *Vampyrops*, notwith-[illegible]

The glans penis is free. The prepuce is reduced to a conical lappet inferiorly.*

Maxillary teeth.—Incisors contiguous or separated by a slight interval. The lateral incisor does not touch the canine tooth. Central incisors with quadrate crown and straight bilobed cutting edge. Lateral incisors subtriangular; crown with concave anterior surface, and oblique, simple, cutting edges. In some individuals these teeth exhibit concave cutting edges and convex lateral borders. The canine is as long as the interval between the two teeth is wide, with low cingulum on all sides except the buccal. The first premolar touches both canine and second premolar or slightly overlaps the latter. The second premolar is larger than the first, with rudiment of protocone. Posteriorly a double buccal contour is seen, with a rudiment of a metacone. The grinding surface of the first molar is elongate, with a slight inclination backward; the protocone is conoidal. Between it and the scarcely fluted buccal aspect a smooth, deeply concave surface is seen. With the exception of an irregular double basal contour all trace of the conoidal shape of the paracone and metacone is lost. The inner of the two lines is often incomplete (see figure). The hypocone is conoidal and well developed. On the buccal surface the positions of the paracone and metacone are well defined, conspicuous, and sectorial. The metacone, which is more especially defined by the inner contour, is coarsely pectinate in some specimens. The second molar is smaller than the first. The inner contour line extends the entire length of the buccal border. The molars are contiguous at their buccal edge only. This

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*The value of this character is apparent when compared with *Sturnira*, in which genus the glans is free beneath only—the abruptly truncated prepuce above being adherent almost to the entire upper surface of the glans. In *Brachyphylla* the glans is concealed by an elongate prepuce.

peculiarity is less marked in the young adult than in some of the older animals.

Mandibular teeth.—The incisors are contiguous, blunt, uniform—an interval existing between the anterior and posterior borders of the cutting edges. Canine excavate posteriorly touching the triangular compressed simple first premolar. The second premolar is a third higher than the first. The cingulum is slightly elevated at the base of the main cusp (paraconid) and provided with a small heel (hypoconid). The first molar much larger than the second, quadrate tapering slightly forward. Protoconid marginal, compressed, sectorial, less than twice the height of hypoconid and expanded at base anteriorly. Paraconid trifid, the main cusp conoidal not distinct from cingulum, marginal hypoconid compressed. Entoconid conoidal, conspicuous, marginal, an intermediate tubercle between it and the paraconid. Second molar quadrate, tapering slightly backward. Protoconid not marginal, but a well defined nearly complete cingulum at buccal base, conoidal, with flange at base anteriorly, paraconid obscurely trifid, the main cusp much the longest, hypoconid sectorial, entoconid conoidal, no intermediate tubercle between it and paraconid. The third molar rudimental scarcely larger than one of the lower incisors; blunt, depressed in center of grinding surface: sometimes provided with a partial cingule.

The milk incisors are retained for a longer time than the other milk teeth. They may remain in the jaw, lying to the labial side of the complete set of permanent incisors.

Remarks.—I am not certain about the identification of some of the cusps of the molar teeth in *Artibeus*. Individual variation occurs in the arrangement of the cusps on the lingual aspect of the first and second mandibular molars, which make it likely that they are developments from a cingulum in a tooth from which all traces of the true cusps have disappeared. If this hypothesis be accepted the description is greatly simplified. But it lacks proof, and demands for *Artibeus* a more abberant position than is suggested by other features in its economy.

The loss of the V-like cusps of the molars, the development of marginal cuspules, the delicate and somewhat elaborate sculpturing on the grinding surfaces combine to make these teeth of *Artibeus* unique.*

After framing the above description I studied the teeth in the allied genera [illegible], *Sturnira* and *[illegible]*. These notes are herewith appended.

[illegible].—The mandibular molars such as in *Artibeus*. The same deeply con-

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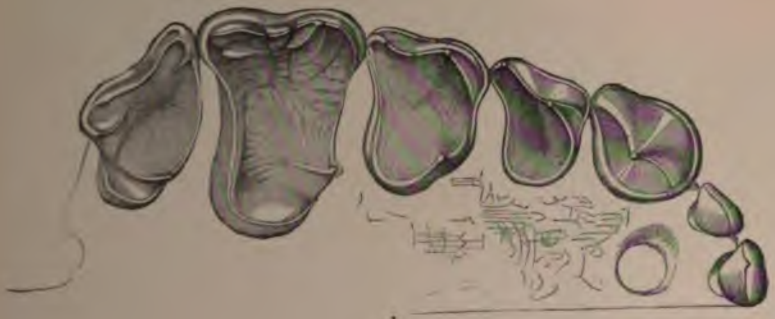
*The following notes on the teeth of allied genera will be of value. In *Dermanura* the lower incisors are twice the length of the same teeth in [illegible] and [illegible]. The upper central incisors in the genus last named are much longer than the laterals and are furnished with oblique cutting edges much in the same manner as in [illegible] and *Vampyrops*. *Artibeus*, *Dermanura*, and [illegible], are readily distinguished from *Vampyrops* by the presence of a marginal cusp (protoconid) on the anterior half of the lingual aspect of the first lower molar.



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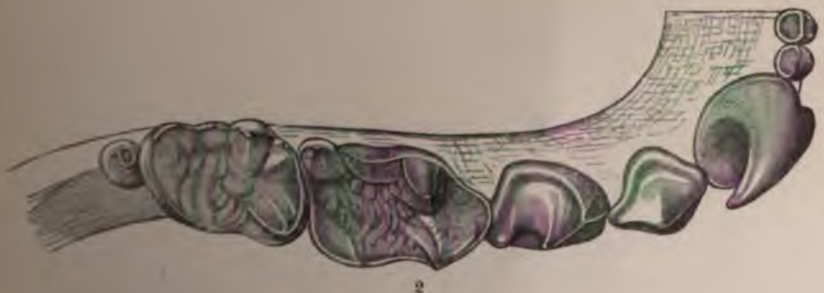

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1. Maxillary teeth of Artibeus perspicillatus. × 8.
2. Mandibular teeth. × 8.

cave on anterior surface. The first premolar much smaller than second, which bears a small denticle on the posterior border. The metacone cremulate on the posterior border. The posterior border is excavated to a point opposite the first molar. The mandibular first premolar is smaller than the second. The first premolar is smaller than the second. The first molar with four simple cusps, the second with three; all are simple and nearly coequal.

Sturnira—The first maxillary premolar as large as second, not compressed from before backward. The maxillary first and second molars tritubercular, no trace of hypocone. Paracone with a double contour line on concave simple grinding surface. Third molar bicuspidate. The first mandibular premolar much wider than second, but of the same height. The first molar larger than second. Paracone is simple, conoidal, marginal with cuspidate commissure so high on lingual border as to resemble a distinct cusp; endoconid same a paraconid. These three cusp-like points are visible from lingual aspect of tooth. Hypoconid scarely smaller than protoconid but not conoidal. Third molar obscurely tritubercular.

Brachyphylla.—Large posterior basal cusp on posterior border of canine; first premolar minute entirely outside of axis of tooth-row. Second premolar with well defined palatal basal lobe (protocone) which is continuous with flutings which extend to apex of conoidal crown which almost reaches level of canine. First molar slightly smaller than second; tritubercular protocone oblique with intermediate cusp between it and metacone. Paracone and metacone subequal (the former being the larger) sectorial and irregularly fluted on palatal sides. Second molar as first but the protocone is straight, *i. e.*, parallel to buccal border, no intermediate cusp on crown but a large marginal cuspule on buccal side between the subequal paracone and metacone (the latter being the larger.) The third molar one-half the size of the first with well defined anterior and posterior commissures. The mandibular premolars subequal, the posterior with a longer heel. The mandibular molars quadritubercular, cusps well defined, crown not excavate.

Notes on the skeleton.—Atlas with inconspicuous or no tubercle on body. No spines on the lower border of the transverse process.

Axis with very small transverse process, which bears no foramen to outside of the foramen for the vertebral artery. No tubercle on the keel on the ventral aspect of the centrum.

Scapula.—The coracoid process scarcely curved and the free end not reaching a point below the level of the glenoid cavity. The free end of the spine angulated. The infra-spinous fossa slightly deepened at the axillary border. The inner tubercle of the humerus slightly raised above the head.

Humerus.—The convexity of the trochlea well defined, broad in front; median concavity deeper behind than in front; the same is true of the limiting ridge; the lateral concavity is weak and not produced back of the longitudinal axis of the humerus. Epicondyle horizontal, conspicuous; no spine on the under surface; no median pit on the shaft beneath the epicondyle.

The radius with a spoon-shaped distal articular surface with markedly-developed side flanges. The biceps impression occupies entire lateral surface of the shaft. The surface for articulation of the ulna is broad above, narrow below, and is throughout irregular.

The proximal rudiment of the ulna is free at the olecranon, but anchylosed with the radius a little above the middle of the shaft. The distal rudiment is a small, hatchet-shaped tubercle.

The trapezium is three times as large as and covers and conceals the trapezoid. It presents a large spheroid surface for first digit, but yields a superficies on same general surface, which is without facet. Proximal surface with dorso-ventral ridge. The trapezoid is sigmoid, slender. The magnum recalls general shape in man; the distal end is large and oblique. The unciform is irregularly prismoidal, with large lateral sigmoid articular notch. The carpus exhibits a flat, scale like element in first row, which remained with the radius in disarticulation.

The second and third metacarpal bones are compressed at proximal articular surface, the second being C-shape and the third spatula-shape. The fourth and fifth are irregularly spinose, the fourth being multifex, articulation axial; the fifth trifex, articulation lateral.

In both *Artibeus* and *Vampyrus* the entire length of the second digit is not greater than the length of the third metacarpal. Hence the movement of digits of third, fourth, and fifth finger do not affect that of the second digit. In Vespertilionidæ (well seen in *Atalapha*) all is different; the second digit of second finger is flexed with the flexion of the entire series. The first metacarpal and the first phalanx of the first digit are as in *Macrotus*. The fifth metacarpal is the longest and the fourth is the shortest. The second phalanx of the third digit is greatly longer than in *Macrotus;* the fifth metacarpal is as long as the forearm. In repose the first digit lies parallel to long axis of the face and above it.

In common with some other phyllostomine bats (*e. g. Stenoderma* and *Glossophaga*), some of the elements of the manus are imperfectly ossified, and hence are flexible. The second digit, the second and third phalanges of the third and fourth digits exhibit this property.

Remarks on measurements.—The fourth metacarpal bone is shorter than the third and fourth. In the type the three bones are of the same length. The thumb, face, tragus, and foot are as large as in the type, while the forearm, auricle, head, trunk, thigh, and leg are smaller. The phalanges of the manus (excepting those of the thumb) are longer, proportionately to the length of the forearm, than in the type. Hence, the thumb, forearm, head, auricle, phalanges, thigh, and leg are variable quantities, while the tragus, face, and foot are fixed.

The females range somewhat larger than the males. In four females the average length of forearm was 70^{mm}. In six males it was 66^{mm}.

Habitat.—Neotropical America.

The reasons for including *Artibeus perspicillatus* in this monograph are derived from a statement of Mr. C. F. Maynard (Mammals of Florida, p. 22). This writer reports the existence of the species in Florida. The following extract is taken from Mr. Maynard's paper:

> While at Key West in the early winter of 1870 I observed several large bats flying about the city, which closely resembled in flight a species which I had seen in northern Florida two years before, but which flew so high that I was unable to shoot them. I was very anxious to obtain a specimen, but as shooting was prohibited in the streets of the city of Key West, and as I never saw the bats elsewhere on the island, I feared that I should be obliged to go away without one. I was, there-

fore, agreeably surprised one morning to see a boy enter my room with a bat in his hand which, from its large size, I knew could be no other than the species which I had so long desired to obtain. He said that he had found it hanging upon the leaf of a tree and had killed it with a piece of limestone. This is, I think, the first instance on record of a bat of this form being taken on the Atlantic slope. This species, without doubt, inhabits the whole of Florida. They fly early in the evening, often before sunset, and, as has been remarked, usually very high.

None of the bats of Florida appear to hibernate, or at best they only remain quiet during an occasionally cold night.*

Measurements.

	U. S. N. M. 11187. Mirador, Mexico.	U. S. N. M. 13220.	A. N. S. P. Exped., 1889. Yucatan.
	mm.	*mm.*	*mm.*
Length of head and body (from crown of head to base of tail)	68	69	65
Length of arm	29	30	25
Length of forearm	57	66	2
First digit:			
Length of first metacarpal bone	5	4½	4
Length of first phalanx	6	6½	5
Second digit:			
Length of second metacarpal bone	41	51	41
Length of first phalanx	4½	5	9
Third digit:			
Length of third metacarpal bone	51	62	49
Length of first phalanx	16½	21	17
Length of second phalanx	30	37½	28
Length of third phalanx	16	20	18
Fourth digit:			
Length of fourth metacarpal bone	50	62	47
Length of first phalanx	13	20	16
Length of second phalanx	20	26	19
Fifth digit:			
Length of fifth metacarpal bone	51	62	47
Length of first phalanx	11	17	11
Length of second phalanx	14	19	15
Length of head	30	34½	29
Height of ear	11½	16	13
Height of tragus	6	6	6
Length of thigh	19	17	15
Length of tibia	23	20	20
Length of foot	13	13	10

Family VESPERTILIONIDÆ.†

Genus CORYNORHINUS H. Allen.

Corynorhinus H. Allen, Proc. Acad. Nat. Sci. Phila., 1865, 173.

Plecotus Leconte, Cuvier's Animal Kingdom (McMurtries' ed.), App. 1831, 431; Cooper, Ann. Lyc. Nat. Hist. New York, 1837, 72, 73; Dobson, Cat. Chirop. Brit. Mus., 1878, 180.

Synotus H. Allen, Monog. N. A. Bats, 1864, 63.

Diagnosis.—Ears with internal basal lobe not entire but almost aborted near the headfold. Nostrils with no trace of nasal cornu. The margins of the dorsally directed aperture everted, the lower outer angle being grooved. The facial clump of glands back of the muzzle elevated into club-shaped masses. Sphenoidal foramen at the bottom of a deep recess. A well-defined hem of membrane between thumb and the second digit. The fifth digit greatly longer than the forearm. The palmar aspect of digits in undissected specimen with outlines defined at proximal ends. The terminal cartilage of the fourth digit axial, small.

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* This paper appeared in the Quarterly Journal of the Boston Zoölogical Society, vol. II, 1883. Mr. Maynard kindly sent me a drawing of the bat he describes. I have no hesitation in identifying it as *Artibeus perspicillatus*.

† VESPERTILIONIDÆ. Bats with volute turbinals of the ethmoid bone; premaxillæ without palatal processes forming a median suture, but in its place a wide interspace which includes the incisive foramen of other types; no spheno-palatine foramine; trapezium with palmer tubercle, and hence thumb erect, *i. e.*, not inclined to flexion on palm; wings adapted for a rapid irregular flight, and animal for

Dental Formula—Molars $\frac{3}{3}$, Premolars $\frac{3}{2}$, Canines $\frac{1}{1}$, Incisors $\frac{2}{3}$, ×2= 36 teeth.

Membranes of the second digital interspace is attached to the ventral border of the third metacarpal bone; that of the third interspace to its dorsal border.* The thumb is semiflexed, callosity rudimental; phalanges disposed to curve forward in flight. The second phalanx of the third digit is longer than the first. The otic capsule much as in *Antrozous*; the external semicircular canal is free from bone. The tympanic bone appears to be united to the capsule (*os petrosa*).

Corynorhinus differs markedly from *Antrozous* in the greater development of the hypocone in both upper and lower molars and in the less rudimental form of the third maxillary molar. The points of the cusps are all more produced than in the genus named.

Since some writers (vide Dobson *l. c.*) do not accept *Corynorhinus* as a valid genus but assign the species to *Plecotus* the following diagnosis of this genus is given. *Plecotus:* the first phalanx of the third, fourth, and fifth digits, longer than the second. Nostrils, as in *Vespertilio*, *i. e.*, with a well-defined cornu and a lunate aperture. The internal basal lobe of the ear entire. The tragus foliate scarcely tapering above. The sphenoidal foramen not at the bottom of a deep recess. The clumps of gland-masses on the snout not raised, indeed, are smaller than in most genera of the family.

The following is the manal formula:

	Millimeter.
Second interspace	2½
Third interspace	12
Fourth interspace	20
Forearm	38

The material available for study of *Corynorhinus* was unsatisfactory. I have three examples of *C. macrotis*—one of them immature—two alcoholics. Of *C. townsendii* I have four examples in alcohol, all adult.

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both aerial and terrestrial progression; ulna with small proximal rudiment rarely forming a well-defined shaft which is anchylosed to the radius (Kerivoula), but usually forming a filament which ends among the muscles of the forearm; accessory cartilage to the fifth digit present except in *Plecoti*; coracoid as a rule bifid (exceptions in *Plecoti* and *Antrozous*); raised folds of skin at the junction of the carpus and metacarpus (except in *Plecoti*); oblique line on the wing membrane at the lower third of the tibia; nose-leaf absent; tail inclosed in the ample interfemoral membrane, or the last joint alone projecting; hypocone rudimental or absent; the paraconid, metaconid, and hypoconid large, subequal.

*Same as in *Antro-*

The Vespertilionidæ have hitherto embraced all the small naked-nosed bats not included in the molossine and emballanurine groups. I have elsewhere* given reasons for assigning *Natalus* to a separate family in close alliance with the phyllostomine bats, notwithstanding that the nose-leaf (at least in the adult) is absent. I have no doubt that *Thyroptera*, *Corynorhinus*, *Euderma*, *Noctilio*, and *Antrozous* are also to be separated from the true vespertilionine forms. The intervals between these outlying genera are unequal. *Thyroptera* is in close relation to *Natalus; Corynorhinus* to *Euderma*. Yet the exhibition of phyllostomine characters, suggest that these genera are aberrant expressions of the leaf-nose types, and are probably the forerunners of the genera of the group in which *Atalapha*, *Vespertilio*, *Adelonycteris*, *Vesperugo*, *Lasionycteris*, and *Nycticejus* are found.

Noctilio exhibits phyllostomine affinities, but approaches more nearly to the molossine than to the vespertilionine group, though the genera *Noctulinia*, *Miniopterus*, and *Chalinolobus* may here be said to occupy an intermediate position.

Antrozous in like manner can be shown to have originated from a phyllostomine stem, though probably at points independent of either of those above named.

1. **Corynorhinus macrotis** (Leconte). The Big-eared Bat. (Plate VI, VII).

Plecotus macrotis Leconte, Cuv. Animal Kingdom (McMurtries' ed), Appendix I, 1831, 431; Dobson, Cat. Chirop. Brit. Mus., 1878, 180.
Plecotus lecontii Cooper, Ann. Lyc. Nat. Hist., N. Y., IV, 1837, 72.
Synotus lecontii Wagner, Schreb. Saügeth., Suppl. V., 1855, 720.
Synotus macrotis H. Allen, Monog. N. A. Bats, 1864, 63.
Corynorhinus macrotis H. Allen, Proc. Acad. Nat. Sci., Phila., 1865, 173.

Diagnosis.—Phalanges of the fourth and fifth digits of equal length. The maxillary central incisor not bifid. The post-digital nerve of the fourth interspace arises at a point midway between the distal and proximal ends of the fourth metacarpal.

The following is the manal formula:

Second interspace	3
Third interspace	15
Fourth interspace	27
Forearm	40

Description.—Ears nearly twice the length of the head; internal basal lobe rudimental, rounded, free inferiorly, but lost in a mere line above and ending on the internal border at the headfold in a small non-projecting tubercle. The internal border moderately convex, turned abruptly backward so as to lie upon the posterior surface of the auricle, and is lost on the headfold. The tip is small, rounded; outer border nearly straight, not incised. The first scallop alone is present; it passes downward and forward to near the angle of the mouth, well to the outside and beyond the external basal lobe, which forms a rounded sharply defined leaflet. The tapering tragus is less than half the height of the auricle; basal notch scarcely defined; basal lobe semicircular, concave above, projecting outward. Nostrils irregularly quadrate, reaching almost to the top of the high muzzle; the borders slightly produced; lower border furnished with a groove; septum absent. Facial glands not extended laterally, but raised toward dorsum of rostrum into a prominent club-shaped mass. Lower lip not moveable, without mental plate.

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*Proc. Nat. Museum.

The coraco-brochialis and triceps muscles not sending fascicles to the wing-membrane.

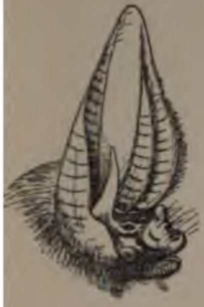
Postdigital nerve arises from the fourth metacarpal bone about midway between the proximal and distal ends. The mesopatagium is provided with a system of muscle-fascicles which are dispersed obliquely from above downward about midway between the forearm and the free margin. Tail just below the pubis is raised from the under surface of the interfemoral membrane; for the rest of its extent it is raised from the upper surface; the tip is not exsert. The calcar is weak, extends less than one-half the length of the free margin of the interfemoral membrane and is without post-calcaral lobe. Foot slender, as long as the thumb.

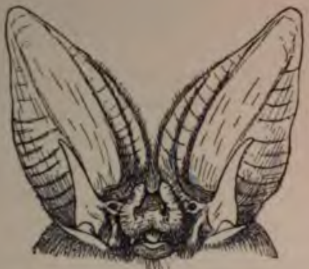
Fur on the dorsum dark brown at apical one-third; dark ash at basal two-thirds; on the ventre the fur is light gray or white at apical one-third; black at basal two-thirds. A sparse growth of hair is seen on the base of the toes.

Maxillary teeth.—Central incisor bifid-posterior cusp much the smaller. Tooth placed at the edge of incisor notched and presents a convex median border. Lateral incisor with long, aciculate cusp; concave on palatal surface, oblique on lateral border, parallel with central tooth on median border. In other respects the teeth as in *C. townsendii* (q. v.).

Mandibular teeth.—These are the same as in *C. townsendii*, except that the incisors are more crowded.

Skull.—The entire region of the vertex of the region of the mesencephalon is elevated and defined laterally by the weak posterior temporal crests. Greatest length 16^{m}. Greatest width 8^{m} to $9\frac{1}{2}^{m}$. Least width 3^{m}. Length of mesencephalon 3^{m}. The length of face from the orbit is 3^{m}. Greatest height 5.05^{m}. Thus the height is absolutely greater than in *Euderma*, while the length is much less. The sagittal crest is absent over the posterior half of the vertex and extends to a line which answers to the middle of the auditory meatus; the anterior temporal impressions are faintly defined. The face-vertex with sharply limited pit-like concavity, which is sharply separated from the anterior nasal aperture. The region of the proencephalon is well defined above. The fronto-maxillary inflation is most marked at the region of the orbit, but to a much less degree than in *Euderma;* the orbital ridge is swollen and faintly marked. The facial opening of the infraorbital canal lies 1^{mm} above the tooth row. The outer wall is sharply crested,





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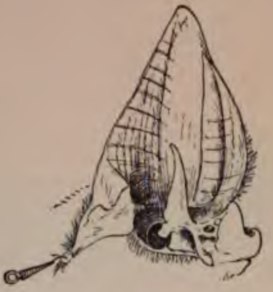

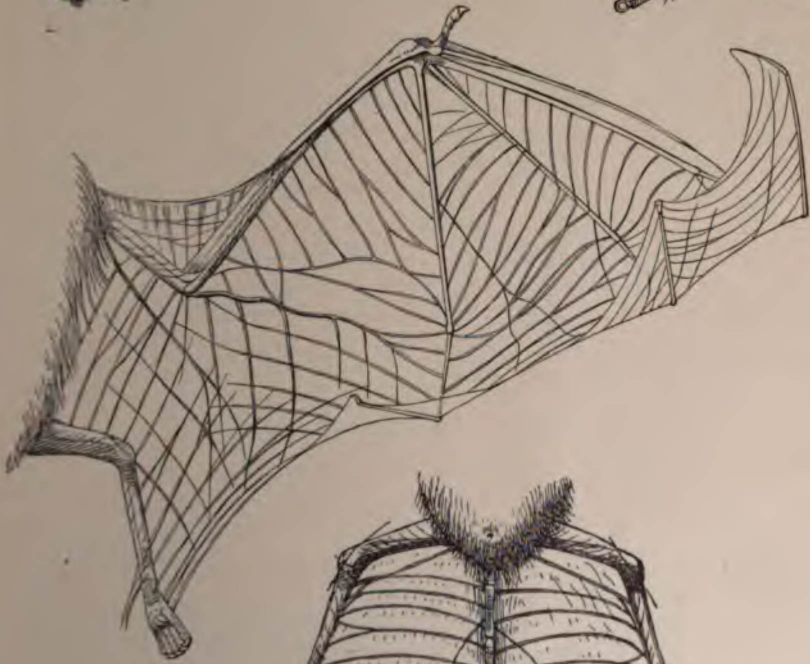

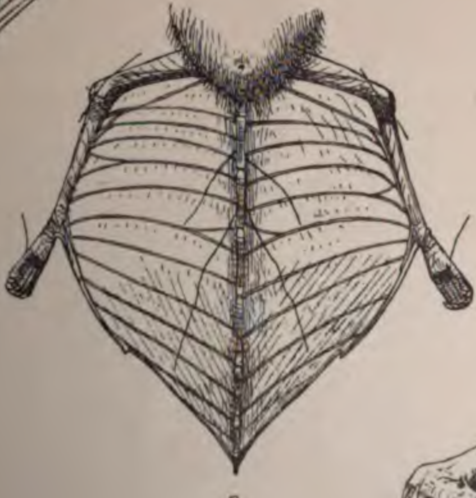

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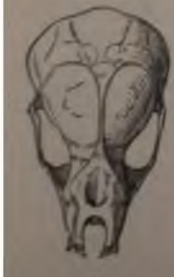

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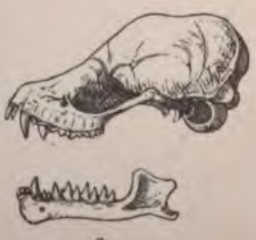


7

CORYNORHINUS MACROTIS.

without pit. A line produced from the upper border of the anterior nasal aperture intersects the junction of the first premolar with the first molar. The zygoma at the posterior third widened and elevated at the upper border. The paroccipital and mastoid processes are rudimentary, and the sterno-mastoid region is scarcely depressed. There is no trace of a sphenoidal tongue. The pterygoid process is conspicuous. The tympanic bone is complete and very large, concealing the cochlea. The tympanic bulla is in contact with the basioccipital and basisphenoid; it is not excavate, but incised anteriorly and barely reaches a line which answers to the posterior border of the glenoid cavity. The coronoid process is acuminate and about the height of the horizontal ramus. The posterior border of the ascending ramus is concave. The angle is produced but slightly beyond the condyle, and is deflected beyond the outer border as seen from above. The masseteric impression is imperfectly limited inferiorly, not reaching the border of the ramus. The angle touches the plane on which the mandible rests. The lower border of the ramus is markedly concave near the angle.

Habitat.—All the specimens examined have been collected in the South Atlantic States, except one from Santa Fé, New Mexico. On the authority of Prof. Baird, it has been obtained at Meadville, in northwestern Pennsylvania. At my request, Prof. J. H. Montgomery, of Alleghany College, Meadville, recently kindly collected a number of bats from this neighborhood, but has not succeeded in procuring *Corynorhinus*.

Measurements.

[No. 6062, from Mus. Comp. Zoöl.]

	Millimeters.
Head and body (from crown of head to base of tail)	46
Length of arm:	
Length of forearm	38
First digit:	
Length of first metacarpal bone	3
Length of first phalanx	4
Second digit:	
Length of second metacarpal bone	32
Length of first phalanx	2
Third digit:	
Length of third metacarpal bone	35
Length of first phalanx	12
Length of second phalanx	17
Fourth digit:	
Length of fourth metacarpal bone	34
Length of first phalanx	9
Length of second phalanx	9
Fifth digit:	
Length of fifth metacarpal bone	34
Length of first phalanx	8
Length of second phalanx	8

	Millimeters.
Length of head:	
Height of ear	27
Height of tragus	12
Length of thigh	15
Length of tibia	19
Length of foot	10
Length of tail	44

Measurements from first edition of Monograph.

U. S. N. M. Cat. No.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5232	1.8	1.7	1.7	0.8	2.8	0.4	1.1	0.6	9.6	Alcoholic.
	1.8	1.7	(?)	0.8	2.6	0.4	1.1	0.6	9.4	Do.
1377	1.6	1.6	1.6	0.9	2.8	0.4	1.0	0.6	9.0	Dry.
4727	1.9	1.8	1.7	0.9	2.8	0.5	1.2	0.7	11.0	Do.
890	1.10	1.8	1.7	0.8	2.8	0.5	1.1	0.6	10.9	Do.

List of specimens.

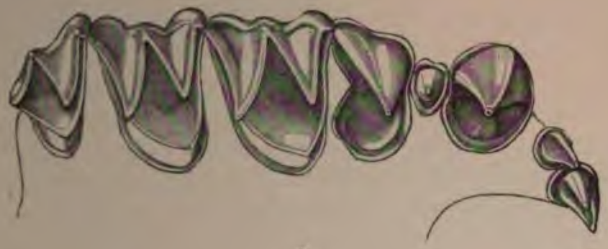
Cat. No.	No. of specimens.	Locality.	Presented by—	Nature of specimens.	Collection.
5451	1	South Carolina	W. Cooper	Dry	U. S. Nat. Mus.
5526	1	do	do	do	Do.
5453	1	Society Hills, S. C	M. A. Curtis	do	Do.
5450	1	do	do	do	Do.
5452	1	Kemper County, Miss	D. C. Lloyd	do	Do.
5407	1	Eutaw, Ala	Prof. Winchell	Alcoholic	Do.
	1	(?)	(?)	Dry	Do.
5234	1	Micanopy, Fla	Dr. Bean	Alcoholic	Do.
4727	1	"United States"	Maj. Leconte	Dry	Do.
5232	1	Santa Fé	W. J. Howard	Alcoholic	Do.

2. **Corynorhinus townsendii** (Cooper). (Plate VII).

Plecotus townsendii Cooper, Ann. Lyc. Nat. Hist. New York, IV, 1837, 73.
Synotus townsendii Wagner, Schreb. Säugeth. Suppl., V, 1855, 720.
Corynorhinus townsendii H. Allen, Proc. Acad. Nat. Sci. Phila., 1865, 173.
Plecotus macrotus Dobson, Cat. Chirop. Brit. Mus., 1878, 180; Allen, Monog. N. A. Bats, 1864, 65.

Diagnosis.—Post-digital nerve arises from near distal end of the fourth metacarpal bone. First phalanx of third and fourth digit shorter than second. The first phalanx, fifth finger, longer than second. Central maxillary incisor bifid. Forearm 38 to 40. Tragus slightly longer than in *C. macrotis*, and the general appearance of the animal is more robust. The fur quite as in *C. macrotis*, with the colors of ventre inclining more to gray than to white.

Maxillary teeth.—The maxillary incisors conical, simple, with entire, well-defined cingula; the inner border of the lateral not touching central. The central much the larger. The two teeth touching, but an interval present between the lateral and the canine. The first premolar minute; resembles lateral incisor. The second premolar with unusually trenchans protocone. The first molar with anterior commissure of protocone



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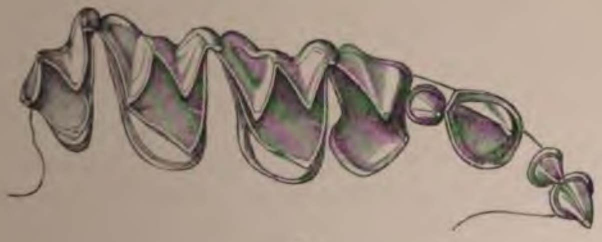

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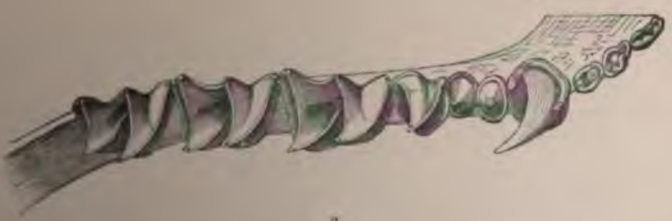

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1. MAXILLARY TEETH OF CORYNORHINUS MACROTIS. X 12.
2, 3. MAXILLARY AND MANDIBULAR TEETH OF CORYNORHINUS TOWNSENDII. X 12.

trenchant and well seen from above. Anterior V slightly smaller than posterior; hypocone absent. The third molar with protocone with entire commissure; anterior V complete; posterior V lacking the greater part of the posterior limb.

Mandibular teeth.—The incisors trifid, scarcely crowded; basal ridge developed into a high cingulum, giving the teeth a multituberculate appearance. The canine with a well-developed cingulum at the lingual aspect; both anteriorly and posteriorly it is furnished with a tubercle. The first and second premolars are small, conical, with complete cingula. The first tooth is slightly the smaller. The cusps of the molars are all high and sharp. The heel is well developed in all the molars, and in the third is triangular. The commissure on base in all the molars is unusually high. The paraconid subequal through molars, inclined forward, the conjoined bases of this cusp and that of the metaconid incised somewhat as in *Macrotus*.

Notes on the skeleton—Scapula.—The coracoid is simple, neither curved backward nor forward; axillary border nearly straight, scarcely convex. *Humerus.*—The epitrochlea as in *Vespertilio;* the lateral groove on the trochlea is sharply defined; olecranon fossa present. *Ulna.*—Proximal rudiment anchylosed to radius; shaft not traceable. Distal rudiment quadrate plate as in *Vespertilio*. The pisiform bone lies across the palmar aspect of the carpus and does not act as a splint to the fifth metacarpal bone.

Habitat.—Western and central portions of the United States, extending south to Mexico.* Specimens in the National Museum are from Utah and the upper part of Missouri.

Measurements.

[No. 1220.]

	Millimeters.
Head and body (from crown of head to base of tail)	38
Length of arm	21
Length of forearm	42
First digit:	
Length of first metacarpal bone	2¼
Length of first phalanx	3¼
Second digit:	
Length of second metacarpal bone	34
Length of first phalanx	2
Third digit:	
Length of third metacarpal bone	35
Length of first phalanx	13
Length of second phalanx	16
Fourth digit:	
Length of fourth metacarpal bone	
Length of first phalanx	10
Length of second phalanx	12

---

*J. A. Allen reports it from Guadalajara, Mexico.

	Millimeters
Fifth digit:	
Length of fifth metacarpal bone	16
Length of first phalanx	10
Length of second phalanx	9
Length of head	8
Height of ear	30
Height of tragus	13
Length of thigh	
Length of tibia	21
Length of foot	9
Length of tail	37

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5231	1.9	1.9	1.8	0.8	2.10	0.4	1.2	0.7	11.0	Alcoholic.
5230*a*	1.9	1.8	1.9	0.8	2.9	0.4	1.3	0.7	11.0	Do.
5230*b*	1.9	1.7	1.9	0.9	2.10	0.4	1.3	0.6	11.0	Do.
5230*c*	1.9	1.9	1.8	0.8	2.9	0.4	1.2	0.6	10.6	Do.
5230*d*	1.9	1.9	1.9	0.8	2.10	0.4	1.2	0.7	10.6	Do.
5230*e*	1.8½	1.9	1.8	0.8	2.11	0.4	1.2	0.6	10.0	Do.
5230*f*	1.9	1.9	1.9	0.9	2.11	0.4	1.3	0.7	10.0	Do.
5230*g*	1.9	1.8	1.8	0.8	2.10	0.4	1.2	0.6	10.6	Do.

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5231	1	Upper Missouri	Dr. F. V. Hayden	Alcoholic	U. S. Nat. Mus.
5230	7	Utah	Capt. J. H. Simpson*	do	Do.

* Collected by C. S. McCarthy.

Genus **EUDERMA** H. Allen.

Euderma H. Allen, Proc. Acad. Nat. Sci. Phila., 1892, 467.
Histiotus J. A. Allen, Bull. Amer. Mus. Nat. Hist., III, No. 2, Feb. 20, 1891, 195.

Diagnosis.—Two premolars in each jaw. Auricle constricted at base, the simple internal and external basal ridges holding it to the corresponding borders of the base of tragus. The internal hem narrow, not over one sixth width of auricle. External basal lobe sharply defined posteriorly by the external basal ridge and is without ridge or lobule; post rictal wart absent. External basal lobe of tragus absent. Snout simple, broad median depression between nostrils. Membranes as in *Corynorhinus*. Auditory bulla not united on inner margin to skull, and reaches to a point opposite middle of glenoid cavity. General character of the teeth as in *Corynorhinus*.

Dental Formula.—Molars $\frac{3}{3}$; Premolars $\frac{2}{2}$; Canines $\frac{1}{1}$; Incisors $\frac{2}{3}$ × 2—

The above diagnosis may be compared with advantage with that of *Corynorhinus* and *Plecotus.*

Corynorhinus.—Three premolars in lower jaw. Auricle not constricted at base; both basal ridges being free from tragus. Internal basal ridge with thick transverse fold simulating an internal basal lobe which is absent. Width of internal hem nearly half that of the auricle. Tragus with defined external basal lobe and notch. External base lobe with internal lobule ending in large post rictal wart. Clavate process on each side of the snout; nostrils with raised border, lumen sinuate.

Plecotus.—Three premolars in each jaw. Auricle not constricted at base. The narrow internal auricular hem not over one-eighth width of the auricle and is produced inferiorly into a lappet. Internal basal ridge simple, free from tragus. External basal lobe not limited posteriorly and bears a minute lobule on inner surface. Tragus with well-defined notch and basal lobe; post rictal wart hairy, conjoined to basal lobe.

The following statements concerning the differential characters of *Euderma, Corynorhinus, Plecotus,* and *Synotus* are herewith submitted. In my judgment *Synotus* is more widely separated from the other three genera than are any of the last named from one another, and it is probably true that *Synotus* is not a member of the group of the plecotian bats, but is in closer affinity with *Vesperugo.*

Euderma.	Corynorhinus.	Plecotus.	Synotus.
Internal basal lobe free crossing internal ridge.	Internal basal lobe not free, rudimentary. Large swollen thread across internal ridge.	Internal basal lobe free, not crossing internal ridge.	No internal basal lobe.
Both internal and external ridges continuous with base of tragus.	Ridges not continuous with base of tragus.	Ridges not continuous with base of tragus.	Ridges not continuous with base of tragus.
Tragus without internal basal lobe.	Tragus with internal basal lobe.	Tragus with internal basal lobe.	Tragus with internal basal lobe.
Terminal cartilage, fourth digit axial.	Terminal cartilage fourth digit axial.	Terminal cartilage fourth digit axial.	Terminal cartilage fourth digit deflected toward thumb.
Coronoid process rounded angle to lower jaw, broad at base.	Coronoid process acuminate; angle to lower jaw not broad at base.	....	Angle of lower jaw narrow at base; coronoid process pointed.
Tympanic bulla extends forward to point opposite middle of glenoid cavity. Spheno-palatine foramen present; the upper orbital border rugose.	Tympanic bulla reaches posterior border of glenoid cavity. Spheno-palatine present; the upper orbital border not rugose.	Tympanic bulla reaches a point slightly in advance of the glenoid cavity. Spheno-palatine foramen apparently absent; Upper orbital border not rugose; trenchant.	Tympanic bulla reaches posterior border of glenoid cavity. Spheno-palatine foramen present; the upper orbital border not rugose.
Palatal plate extends back of line of last molar for a distance equalling nearly one-half the length of the pterygoid process.	Same	....	Palatal plate extends back of line of last molar for a distance equalling one-third the length of pterygoid process.
Anterior temporal crest not marked.	Anterior temporal crest not marked.	Sagittal and anterior temporal crests marked.	Sagittal and anterior temporal crests marked.
Second upper premolar not touching first molar	Second upper premolar not touching first molar.	Second upper premolar not touching first molar.	

1. Euderma maculata (J. A. Allen).

Histiotus maculatus J. A. Allen, Bull. Amer. Mus. Nat. Hist., III, 1891.

Diagnosis.—The diagnosis of the single species is that of the genus.

Description.—Ears three-fourths length of the forearm, broad at tip, united by a small membrane. Internal basal lobe well defined. Internal basil ridge extends nearly the entire length of the auricle. External border simple, entire, without scallops. The external basal lobe well defined, simple, not recurved, hairy on outer surface. Auricle greatly constricted opposite base of tragus, to which it is attached; no external basal ridge. Tragus elongate, but scarcely narrowed at tip, little more than one-third the length of the auricle, straight or slightly convex on inner border, moderately convex on outer border; basal notch shallow, indeterminate; no basal lobe. Muzzle simple, depressed in middle; glands on the side rudimental, not club-shaped; nostril entire oval, without cornu.

The auricle is marked with numerous transverse striæ at outer two-thirds excluding the tip. The inner border and tip fringed with short hair, a sparse growth occupies the inner surface of the auricle from the inner border of the internal basal ridge.

Membranes.—The thumb disposed to be flexed, the membrane extending to the base of the first phalanx. A distinct hem extends between the thumb and second digit. The second digital interspace 3^{mm} wide. Metacarpal bones distinct on palmar aspect. Palmar folds at fifth metacarpal two in number. The terminal cartilage of the fourth digit axial. Foot one-seventh of the length of the forearm. Tail as long the forearm, tip exsert.

The markings on the membranes are as follows: In the fourth interspace the predigital nerve arises midway along the fifth metacarpal and the post digital from the distal fourth of the fourth metacarpal bone. Oblique tibial lines four in number. The interfemoral membrane entire, ample, marked by ten well-defined complete transverse lines. Intercostals twelve in number, ranging obliquely outward and upward.

Fur.—Black and white hues arranged in a manner unique in Cheiroptera. Dorsum with fur of a prevailing black, the hair being uniformly long and unicolored, excepting at the base of the ears, over the shoulder blades, and at the rump, where the hair is white. The clumps on the ear are unicolored; those on the shoulder blades have hair with basal half black; that on the rump is intermingled with black, but otherwise the hair is as on the shoulder blades. The nape of the neck, crown, and base of the ears, where they join the crown, of a more rusty black than that of the dorsum generally. This arrangement is limited by the low band which unites the ears; the face is sparsely covered with blackish hairs; the lips at the sides are whiskered; the spaces about the eyes are naked. The under surface of the body with white as its prevailing color, the basal portion of the fur everywhere being black, excepting where the large ear extends down on the side of the neck. In this region (viz the upper half of the neck) the hair is pure white and unicolored and continuous above with the basal ear clumps. The lower half of the side of neck is black throughout. A faint white line extends across the shoulder to unite the clumps on the shoulder blades to that of the ventre. The fur otherwise black at basal two thirds, apical third, white. The arm at its basal third black. The extent of the white portion diminishes from above downward. Membranes everywhere naked.

Skull.—Brain-case, low, quadrate, the height one-half the bimastoid diameter. The metencephalon as long as mesencephalon and proencephalon. Sagittal crest rudimentary, does not extend beyond a line answering to the middle of the zygoma, the remaining portions of the posterior temporal crest widely separated; the anterior not defined. Dorsum of face vertex with a shallow concavity which is not sharply defined; orbit with inflated inner wall and rugose elevated upper border; lachrymal tubercle marked. Infraorbital canal short; the foramen on line with interval between second premolar and first molar. Line of the upper margin of the anterior nasal aperture if produced would intersect the second premolar; tympanic bone apparently incomplete above.

The paroccipital process bold, trenchant; sterno-mastoid impression deeply concave; mastoid composed entirely of squamosal element. Zygoma quite as in *Corynorhinus*—the squamosal part twice as wide as maxillary; spheno-palatine foramen present, of large size. Occipital crest trenchant. Tympanic bone greatly inflated, equals one-third the length of the skull, not touching basioccipital, or basisphenoid; excavate anteriorly. It extends to a line which answers to the middle of the glenoid cavity. The mesopterygoid fossa as long as one-third the distance from the posterior palatal border to the incisors. The sphenoidal foramen is at the bottom of a deep recess. The coronoid process is round, small, raised scarcely one-third the height of the ascending ramus; lower border of the horizontal ramus near the angle slightly concave. The angle is raised from the plane on which the mandible rests. Atlas with large foramen for vertebral artery which rests on a mere thread of bone; transverse process semicircular without spine. In common with other cervical vertebræ the tubercle on anterior surface of body is marked. Ribs twelve in number. Both presternum and mesosternum keeled. Scapula much as in *Corynorhinus*. It was mutilated in the single specimen examined.

Maxillary teeth.—Incisors contiguous, slightly inclined toward the median line, but the lateral tooth separated from the canine by a moderate interval. Central incisor cuspidate with a small cuspule projected midway on the posterior surface; a distinct cuspule also arises from the cingulum posteriorly. Lateral incisor one-half the size of the central, and cuspidate, with a small cuspule arising from the cingulum on the anterior and a second on the posterior portion. Canine not larger than the second premolar, the buccal surface is abruptly convex. The first premolar is small not wedged in, with complete cingulum. The space between it and canine narrower than that between it and second premolar. The second premolar as long as the canine and slightly fluted, Molars as in *Corynorhinus*.

Mandibular teeth.—Incisors crowded, trifid, *i. e.*, the main cusp possesses a well developed cuspule on each side the base, the cingulum on the posterior side being large. The first and second teeth overlap for a distance equaling one-half of their diameters. The third incisor retains a posterior cuspule which is larger than the anterior and separated from the main cusp by a wide interval. The canine is small and projects but a slight degree above the incisors. It exhibits a marked cuspule on the cingulum anteriorly.

The premolars are separated by a small interval. The first is smaller than the second, distinctly trifid, and contiguous to the canine. The second is much larger and trihedrál. The molars as in *Corynorhinus;* the apices of cusps acicular; the lingual surface of hypoconid is trifid.

Euderma is based upon the type specimen of *Histiotus maculatus.* Through the courtesy of Dr. J. A. Allen I have recently had an opportunity of examining it.

Dr. Allen believed that this striking form belonged to *Histiotus* on the ground that the shape of the ears and of the muzzle, as well as the disposition of the membranes, were of the same general type, while the teeth were the same in number. In my opinion these statements require modification. A minute first upper premolar is to be seen in the rather large space between the canine and the second premolar, thus separating Dr. Allen's species from *Histiotus*, in which a single upper premolar is present. Together with this peculiarity I find that the general characters of the skull, the teeth, and the wing membrane are like those of *Corynorhinus.* Indeed, it may be said to be a Plecotian genus without muzzle processes, and since with these peculiarities the new form possesses but two premolars in the lower jaw, it is quite distinct. I, therefore, propose to describe it as follows:

Habitat.—The single specimen known was collected by Mr. Thomas Shooter, Pirui, Ventura County, Cal. It was caught on a fence.

Genus **ANTROZOUS** H. Allen.

Antrozous H. Allen, Proc. Acad. Nat. Sci. Phila., 1862, 247; Monog. N. A. Bats, 1864, 66; Dobson, Cat. Chirop. Brit. Mus., 1878, 170; Coues and Yarrow, Wheeler's Exped., Zoöl., 1875.

Nose high, tapering, narrow; snout angular, blunt; nostrils apical, lower (outer) borders joining above in a transverse line; ears longer than head, not joined.

Dental Formula.—Molars $\frac{3}{3}$, premolars $\frac{1}{2}$, canines $\frac{1}{1}$, incisors $\frac{1}{2}\times2=28$.

In the incomplete tympanic bone, in the absence of the palatal plate to the premaxilla, in the markings on the fourth digital interspace, in the shape and relations of the ulna, in the details of the molars, and in the arrangement of the nasal scrolls, *Antrozous* is in alliance with the Vespertilionidæ. Affinity with *Corynorhinus* is suggested by the shape of the muzzle-glands. *Antrozous* resembles *Atalapha* in the shapes of the last molars as well as in the proportions of the hypoconid. In the number and arrangement of the premolars and molars, as well as in the shape of the upper premolar, *Antrozous* is strikingly like *Dasypterus*. In the number of incisors in the lower jaw, in the free lower lip, in the nasal formula, in the disposition for the nostril to bear a vertical internarial ridge and the upper border of the muzzle to exhibit a transverse outgrowth, in the presence of a hem on the pollical side of the second metacarpal bone, *Antrozous* recalls the Phyllostomidæ.

In the restriction of the lower incisors to four in a family where the dominant number is six it is of interest to note that in *Nyctinomous brasiliensis* the third incisor on each side is rudimental or may be lost, thus reducing the number from six to four, the number normal to *N. macrotis* and *Promops*.

Peters has called attention to the affinity between *Antrozous* and *Nyctophilus*. I have lately been able to make a comparison between these genera, so far removed in geographical range. The following characters have not been used before in classification:

Antrozous.	*Nyctophilus.*
Transverse muzzle-band continuous with the lower margin of the nostril; thus the depression of the nostril is continuous with the *groove above* the nostril.	Transverse band is continuous with the upper margin of the nostril; thus the depression of the nostril is cut off from the *pit above* the nostril.
External basal lobe of the auricle without an inner fold.	External basal lobe of the auricle with a conspicuous inner fold.
Terminal cartilage of the fifth digit bifid, the somad lobe prolonged; inconspicuous accessory cartilage.	Terminal cartilage of the fifth digit acicular; conspicuous accessory cartilage.
The nerves in the fourth interdigital unequal, the post-digital much the longer.	The nerves of the fourth interdigital space of equal length and arise on same level.
Protocone small, not extending beyond the paracone.	Protocone large, extending entire length of tooth.
Upper premolar scarcely fluted, without cingulum on palatal surface. Lachrymal process small, no supraorbital ridge; facial vertex convex.	Upper premolar deeply fluted, with cingulum on palatal surface. Lachrymal process and supraorbital ridge trenchant; facial vertex flat or concave.

The shapes of the premolars and molars, the presence of the accessory cartilage to the fifth digit, the number of teeth in the lower jaw, are characters which ally *Nyctophilus* to the vespertilionines and place it near *Synotus*, while no characters suggest its affinity to the phyllostomines, unless the shape of the nose-leaf be held to be of this value. In common with *Corynorhinus* and *Antrozous*, the muzzle glands unite back of the nose-leaf. On the whole, I incline to the opinion that *Nyctophilus* did not arise from a stem distinct from that from which sprung the vespertilionines, while *Antrozous* arose from the phyllostomines at a point not far remote from the vampyrine group, or the un known ancestral stem of *Natalus* and *Thyroptera*.

1. **Antrozous pallidus** (Leconte). The pale bat. (Plates VIII, IX.)

Vespertilio pallidus Leconte, Proc. Acad. Nat. Sci. Phila. VII, 1855, 43; Baird, U. S. a Mex. Bound. Survey, Report II, 1858, Pl. I, Fig. 1.

Antrozous pallidus H. Allen *l. c.*; Dobson, Cat. Chirop. Brit. Mus., 1878, 170; Cou Amer. Nat., 1867, 283; Coues and Yarrow, Wheeler's Exped., Zoöl., 1875, 85.

Diagnosis.—Scallops of auricle not breaking convex outline of out margin; external basal lobe concealed in part. The vespertilioni tragus half the height of the auricle. Head folds continuous on th dorsum. Transverse ridge defines the upper border of the blunt muzzl The nostrils simple, lunate. Chin plate subtriangular, defined. I cisors in lower jaw, four in number. Protocone rudimental; last maxi lary molar but half the size of others and composed of rudimental pr tocone and paracone. Proximal rudiment of the ulna not anchylos to radius at elbow. Muzzle glands flat, nearly confluent above. Th second and third metacarpals distinct on palmar surfaces. Phalang of the third digit of one length; the first phalanx of the fourth an fifth digit longer than the second. A well-defined hem of membrane seen between the thumb and second digit; the fifth digit greatly longe than the forearm. The terminal cartilage of the fourth digit deflect toward the second digit. Numerous closely arranged muscle fibe arise from the tibia near the oblique tibial line and are dispersed ov the greater part of the membrane nearly to the fifth digit.[*] The ol cranon is dorsal, the membranes arising from the epicondyle. The se ond and third metacarpals are not on level of membrane, but rais above it, and not crossed by oblique lines. This easily distinguish *Antrozous* from other genera of Vespertilionidæ.[†]

The manal formula is as follows:

Second interspace...
Third interspace...
Fourth interspace...
Forearm...

The greater part of the free margin of wing membrane with a delica buff border. This is not peculiar, but appears to be unusually co spicuous.

The tail is raised from the plane of the undersurface of the interfe oral membrane near the pubis, but for the rest of its length it is rais from the dorsal. The terminal joint is exsert, and bears a small flesh tip. The calcar is longer than the foot and ends in a small lobe. Th post calcaral lobe is fleshy and obscurely defined. The interfemor membrane is crossed by numerous broad transverse lines.

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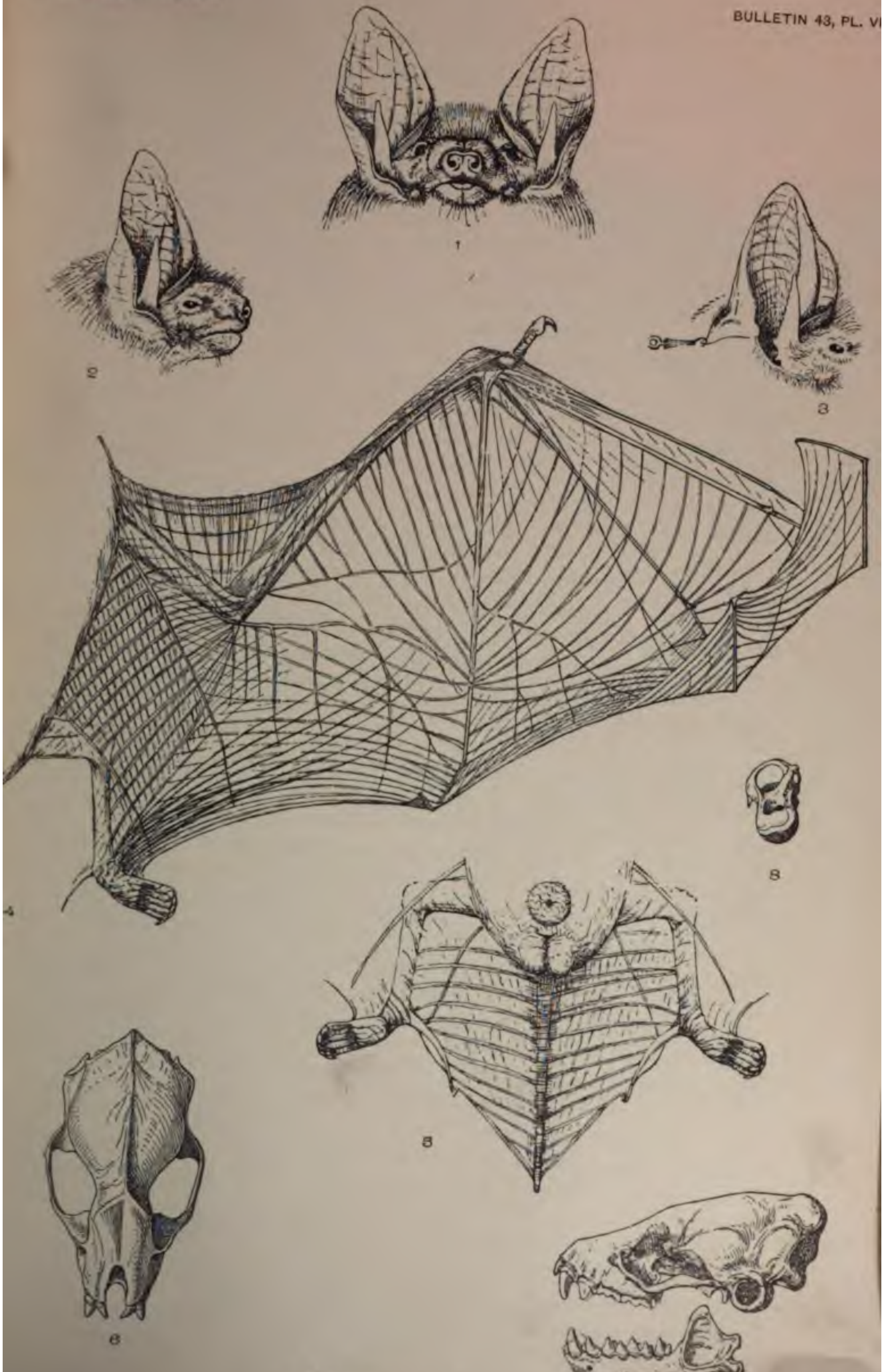
[*] The accessory cartilage must be sought for with care by the aid of a powerf lens.

[†] The statement of E. Coues that the second digit has two phalanges is not co firmed.

EXPLANATION OF PLATE VIII.

FIG. 1. Front view of head of *Antrozous pallidus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIG. 8. Os petrosa.



ANTROZOUS PALLIDUS.

The outer border of the ankle strengthened by a number of trabecular lines, which diverge in the endo partagium and intersect the lines passing between the humerus and the inferior extremity. Fascicles from coraco-brachialis and triceps muscles well developed. In the fourth interdigital space the predigital nerve appears at the distal third of the fifth metacarpal bone, while the postdigital appears from about the middle of the fourth metacarpal bone. Fascial bands marked at the base of the fifth digit.

Variations.—Two varieties of color are observed in this species—the fawn and the yellowish brown. The first was the one described by Maj. Leconte. This author says: "Hair light fawn colored, tip with darker, beneath paler." The yellowish brown may thus be described: Hair above light brown at base, darker at tips; below lighter brown not tipped. In some instances the brown tip above assumes a reddish tinge, and the fur beneath becomes almost white. The interfemoral membrane is entirely naked. At the base of the thumb a few brown hairs are found. The membrane to underside calcar in some individuals extends obliquely across to the hallical side of foot. As above stated the chin plate is often divided in middle line by a groove. An internarial vertical ridge is sometimes faintly defined. The nostrils are subject to slight variation in size of median part of aperture converting the lunate into an inverted comma-like figure.

Rugæ.—The folds sèven in number. Between the second and the third, the third and the fourth, the fourth and the fifth, secondary crenulated folds appear.

Maxillary teeth.—The single maxillary incisor is simple, conical with a pointed basal cusp. Canine with posterior surface outside of axis of tooth row; palatal surface broad, marked by a longitudinal column which gives to it the appearance of a second cusp. The first molar with protocone raised slightly above the line of the small cingulum, the oblique anterior commissure being absent. An interval exists between the protocone and the posterior V. The anterior V is less than one-half the size of the posterior, both in vertical and bucco-palatal direction. The hypocone is absent. The second molar with protocone as in first molar. The anterior V is much larger than in tooth just named, but relatively smaller than in the corresponding teeth of other genera in the family. The third molar much as in *Atalapha*. The first limb of the anterior V alone marked; the protocone rudimental.

Mandibular teeth.—Incisors, trifid, not crowded. Canine with oblique cingulum on lingual aspect with no posterior tubercle. The first premolar obscurely bifid. First and second molars with thickened commissure to heel (hypoconid) encroaching on the grinding surface. The heel of the third molar a mere rudiment on lingual side.

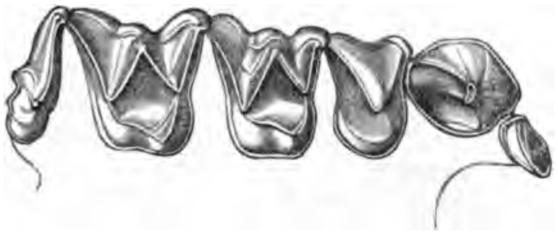
The paraconid and metaconid close together, and form a narrow base to the triangle formed by these elements and the protoconid. The hypoconid is much less developed than either of the other elements.

Skull.—The sagittal temporal crest is high and conspicuous over the mesencephalon and rudimentary over the metacephalon and proencephalon. A distinct convexity lies over the proencephalon. The anterior temporal crests are well defined. A tubercle lies at the basal end of each crest. From this tubercle forward the imperfectly defined upper border of the simple inner orbital wall extends. The vertex of the face is without nasal eminence; a groove extending from the beginning of the sagittal temporal crest to the anterior nasal aperture. The maxilla is without concavities. The anterior border of the vomer corresponds to the middle of the first maxillary molar. The nasal bones and the horizontal plates of the superior maxillæ advanced 2 millimeters beyond the vomer. Anterior nasal aperture incised. The inner wall of the orbit is convex. The lachrymal foreamen is one-half as large as the infraorbital. The infra-orbital foramen relatively large and placed near orbit. The two parts of the tympanic bone do not unite but conceal the cochlea; the basisphenoid bone retains a nearly vertical auditory process. The mastoid is smaller than the paroccipital process. The sterno-mastoid impression is narrow, elongate, not inflated. The external semicircular canal is almost entirely, and the horizontal quite, covered with bone. The posterior and upper surfaces are as in *Atalapha*. The apertures in the cranium by which the otic capsules approach the periphery are circumscribed. The inner border of the condyle of the lower jaw is produced, acuminate. The masseteric impression is weak inferiorly; the angle is broad and flat, quite unlike other vespertilionine forms excepting perhaps Harpiocephalus. It lies in a line with the middle of the condyle and is therefore not deflected; the lower border of the fossa for the insertion of the temporal muscle forms a ridge which is continuous with the line of the alveolus. The ethmoid bone in this genus closely resembles that of other Vespertilionidæ. The ectoturbinal is compressed medio-laterally.

Notes on the skeleton.—*Scapula:* coracoid process turned forward at tip. Axillary border markedly convex below impression for triceps muscles. *Humerus:* epitrochlea projects horizontally, deflected downward, and is flat and broad; lateral trochlea weak, scarcely defined; no olecranon fossa. *Carpus* not distinctive: pisiform lies across palmar aspect.

Penis with a cauliflower-like thickening to prepuce.

Habitat.—The pale bat is found in California, Oregon, Cape St. Lucas, Mexico and Arizona. It is abundant at Fort Yuma. E. Coues states that it infests the houses and annoys the inmates by its scrambling about the recesses in the walls and copings. The naked muzzle has "a peculiar livid hue in life, rendering the animal more repulsive and forbidding than is usual even in this family."



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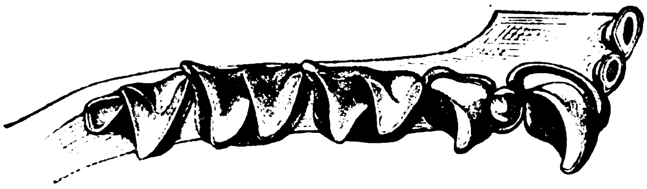

2

1. MAXILLARY TEETH OF ANTROZOUS PALLIDUS. X 8.
2. MANDIBULAR TEETH OF SAME. X 8.

Measurements from an average of four specimens.

	Millimeters.
Head and body (from crown of head to base of tail)	48
Length of arm	31
Length of forearm	51
First digit:	
Length of first metacarpal bone	3½
Length of first phalanx	5
Second digit:	
Length of second metacarpal bone	39
Length of first phalanx	2½
Third digit:	
Length of third metacarpal bone	43
Length of first phalanx	13
Length of second phalanx	13
Fourth digit:	
Length of fourth metacarpal bone	43
Length of first phalanx	12
Length of second phalanx	11
Fifth digit:	
Length of fifth metacarpal bone	43
Length of first phalanx	11
Length of second phalanx	8
Length of head	23
Height of ear	26
Height of tragus	
Length of thigh	17
Length of tibia	19
Length of foot	11
Length of tail	41

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
152	2.10	2.0	2.0	0.9	3.0	0.4	0.10	0.6	12.0	Dry.
538	2.0	(?)	2.0	0.8	3.0	0.5	0.9	0.5	10.6	Do.
521	2.4	(?)	1.10	0.8	3.0	0.5	0.10	0.5	11.0	Do.
[illegible]		1.6	2.0	0.9	3.4	0.5	1.0	0.4	11.0	Do.
[illegible]	(?)	(?)	2.0	0.9	3.0	0.5	0.10	(?)	(?)	Do.
431	2.6	(?)	2.0	0.9	3.4	0.5	0.10	0.6	11.6	Do.
[illegible]	2.0	1.6	1.11	1.0	3.0	0.4	0.10	0.6	11.0	Do.
171	2.0	1.6	2.0	1.0	3.0	0.5	0.12	0.7	11.2	Do.
	2.4	1.6	2.0	0.10	3.4	0.5	1.1	0.7	11.6	Do.
45	2.5	1.9	2.0	0.9	3.5	0.5	1.0	0.7	12.0	Do.

List of specimens.

Cat. No.	No of specimen.	Locality.	Presented by—	Nature of specimen.
152	1	El Paso (Boundary Survey)	J. H. Clark (type)	Dry.
5241	1	San Elizario, Tex	Dr. C. B. Kennerly	Alcoholic.
5240	1	Fort Bliss, N. Mex	Dr. S. W. Crawford	Do.
5456	1	Fort Dalles, Oreg	Dr. Geo. Suckley	Dry.
538	1	Posa Creek, Cal	Dr. A. L. Heermann	Do.
521	1	Tejon Valley	do	Do.
[illegible]	1	Fort Tejon, Cal	John Xantus	Alcoholic.
[illegible]	5	do	do	Do.
[illegible]	4	[illegible]	Maj. G. H. Thomas	Do.
			John Xantus	Do.

While the sheets were passing through the press the following additions have been made to my study of *Antrozous* and its allies, *Dasypterus*, *Corynorhinus*, and *Nyctophilus*. In *Antrozous* the paraconids and metaconids are indistinctly defined and much crowded; in *Dasypterus* they are well defined and separated from each other, as is the case in the family. *Antrozous* differs from *Dasypterus* in the presence of a broad, flange-like epicondyle; in the simple (nonbifid) coracoid process; in the smaller pisiform bone, which shows no disposition to be prolonged downward along the shaft of the fifth metacarpal bone; in the fifth metacarpal bone being almost the length of the fourth; in the greater trochanter being broad, and not deflected backward; and in the outer femoral condyle being smaller than the inner. The first phalanx, respectively, of the second, third, fourth, and fifth toes are disposed to be dorsiflexed on the metatarsus—a character apt to be repeated in all scurrying forms. I say apt to be repeated, for it is an adaptive character and due to muscle traction. The reader is referred to the figure of *Adelonycteris fuscus* in illustration of the shape taken by the toes when the animal lies prone. This position is sometimes also assumed in specimens preserved in strong alcohol. The absence of such a disposition in *Corynorhinus* and *Dasypterus* is in consonance with other characters, namely, that in these genera the foot is adapted to hanging rather than to scurrying, and that both genera are of the broad-winged parachuted type of flight rather than of the narrower-winged zigzag-flying type. One notes, therefore, without surprise that the third finger, both in *Corynorhinus* and *Dasyoterus*, is longer than in *Antrozous*.

In *Nyctophilus* it is seen that the inner condyle of the femur is smaller, and the greater trochanter is deflected backward—the last character especially being best developed in parachuted types.

The union of gland-clumps back of the nose-leaf in *Antrozous* is in evidence of a disposition seen in *Brachyphylla* and *Phyllonycteris*. So far as it goes, it indicates an approximation of the genus to the phyllostomines.

Peters (SB. Akad. Berlin, 1882, 987) places *Antrozous* and *Nyctophilus* in association with *Rhinophylla* and *Megaderma* (*!*). It is remarkable that *Macrotus* should also have been placed in a similar alliance. (See this genus.) I have had no means of instituting comparisons with either of the forms last named.

Genus **VESPERTILIO** Linnæus.

Dental formula.—Molars $\frac{3}{3}$, premolars $\frac{3}{3}$, canines $\frac{1}{1}$, incisors $\frac{2}{3}\times 2=48$ teeth.

The genus *Vespertilio* will be restricted to those bats which, havin
on each side of the jaw three premolars and three molars, hav
dition two upper and three lower incisors. Each species
erect, tapering tragus and a marginal external basal lo

Both the internal and external basal lobes are near together and form the lower end of an ellipse of which the tip constitutes the upper end. In contrast with *Kerivoula* and *Natalus* the scallops come well forward in front of the conch. Both sides of the auricle in good specimens are usually marked with raised arborescent lines. In further contrast with *Kerivoula* and *Natalus* (genera which have the same number of teeth as *Vespertilio*) a phalanx is present in the second manal digit. The third digit is scarcely longer than the combined lengths of the body and the lower extremity, while an oblique tibial line is present on the wing membrane. The scallops of the auricle are membranous (*i. e.*, not thickened), and are not incurved toward the tragus in the manner which is so conspicuously the case in *Adelonycteris* (q. v.). The protocone of the third upper premolar is well defined. The post-digital nerve of the fourth interspace arises from the side of the fourth metacarpal bone near the middle.*

The exact relations which obtain between *Adelonycteris*, *Vesperugo* and the older genus *Vespertilio*, have not been determined. This arises from the fact that minute variations in the numbers of teeth in bats appear to be less denotive of structural peculiarities elsewhere in the economy that is the case with the mammalia generally. Dobson (*l. c.*) places *Adelonycteris*, *Vesperugo* and *Lasionycteris* in the same group, each being the type of a sub-genus. But the intervals between members of the group are most unequal. *Adelonycteris* and *Vesperugo* can scarcely be separated except by the teeth while *Lasionycteris* has distinguishing characters in many parts of the periphery.

While the species of *Vespertilio* are exceedingly variable, it is of interest to note that the wings are quite constant in form. Scarcely any distinctions are discernible between these parts in species so remote in areas of distribution as those of Europe and America. The shape of the tragus is of more exact specific value than the wings and on the whole yields the best single character of the skin surface. The interfemoral membrane is variable and is of much less value than the tragus in denoting the constancy of species. The same may be said of the auricle, for its shape and proportions are more generic than specific in significance, though it must be conceded that the size of the first scallop and the character of the outer border above the scallop distinguish varieties. At best the American species are less sharply distinguished from one another than are those of the old world. In support of this statement the ensuing notes are presented of my observations on a few well-known exotic forms:

V. muricola (India).—Nostril with cornu well defined with prominent margins, border of nostril at muzzle imperfectly limited, septum recedent obscure. Muzzle

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***Vespertilio*, according to Coues and Yarrow (Wheeler Expedition, 1875), includes all bats with $\frac{1}{2}, \frac{2}{2}, \frac{2}{3}, \frac{3}{3},$ premolars. These characters define respectively the genera (as defined by them) *Vesperus*, *Vesperugo*, *Vesperides*, and *Vespertilio*.

glands distinct, nodular. Postmental wart constitutes a large, hard nodule. Thumb directed outward, scarcely larger than its metacarpal bone; callosity large.

V. nattereri (Europe).—Nostril as in *V. muricola;* muzzle and post mental glands rudimental. Internal margin of the auricle and internal basal lobe not lying against the head. Outer margin of the base of the tragus obscurely separated from the inconspicuous lobule. Tragus greatly produced, filiform. First metacarpal bone strongly flexed, outline defined; callosity small. Thumb scarcely if at all projected beyond the contour of the second metacarpal bone. Oblique tibial line arises from the distal third of the tibia.

V. capaccinii (Europe).—Feet enormous; tragus long, filiform; membrane from ankle, or a point slightly above it, covered with hair which also clothes the leg and the sides of the interfemoral membrane.

V. mystacinus (Europe).—As opposed to the preceding this species is not so easily distinguished from the American species (vide Monograph). The tragus is quite as in the phases of our Western States. The fur presents some distinctive features, viz, in the different hues of brown of the back.

The American species further resembles *V. mystacinus* in the bearded upper lip, especially the western forms, as stated in Monograph, p. 60. In alcoholic specimens this is less conspicuous than in the dry, for the hairs are soft and readily cling to the skin. In some varieties the hairs quite thickly clothe the sides and front of the face, and are conspicuous from their black color. Apart from the wing membrane this is the best peripheral character by which *Vespertilio* can be distinguished from *Adelonycteris* and *Vesperugo.*

The difficulties acknowledged in identifying the American species are apparently insuperable, so great is the range of variation in the proportions of the ears, thumb, feet, tail, and phalanges of the manus, and in the coloration of the fur and the membranes. If the purposes of zöological science should end with the identification of species, the student might well be discouraged in his studies in this field. But fortunately the very intricacies of the subject suggest problems, in the attempts to solve which, his knowledge of the life and structure of these little organisms can not fail to be increased.

After careful consideration from the available material, I have concluded that there are three species of *Vespertilio* in the United States, namely, *V. gryphus*, inhabiting the country east of the ninety-eighth degree parallel longitude; *V. albescens*, and *V. nitidus*, in the country west of the line above named.

Numerous variations exist which make it unsatisfactory to frame diagnoses of these species after the manner seen elsewhere in this memoir. Such variations are of great interest, and it will be found convenient to retain for them names of well-marked varieties as though they had specific value. Among such I include *V. lucifugus* under *V. gryphus; V. melanorhinus* under *V. albescens; V. macropus* under *V. albescens; V. evotis* under *V. albescens; V. longicrus* under *V. nitidus; V. yumanensis* under *V. nitidus.*

Variations in animals are commonly included under the heading
the regions of country in which they occur and by which th
bution is limited. While varieties so defined are de

ones, two other kinds are recognized as present in the American species of *Vespertilio*. The first of these is ontogenetic and consists in adults not infrequently retaining in an irregular manner some of the proportions of the young. This I propose calling pedomorphic variation, or pedomorphism. The second is due to depositions of black pigment in increased proportion in those parts of the skin which is not covered by fur, as on the ears, membranes, snout, and feet. This I propose calling melanic variation. Pedomorphic and melanic variation is seen in all three species.

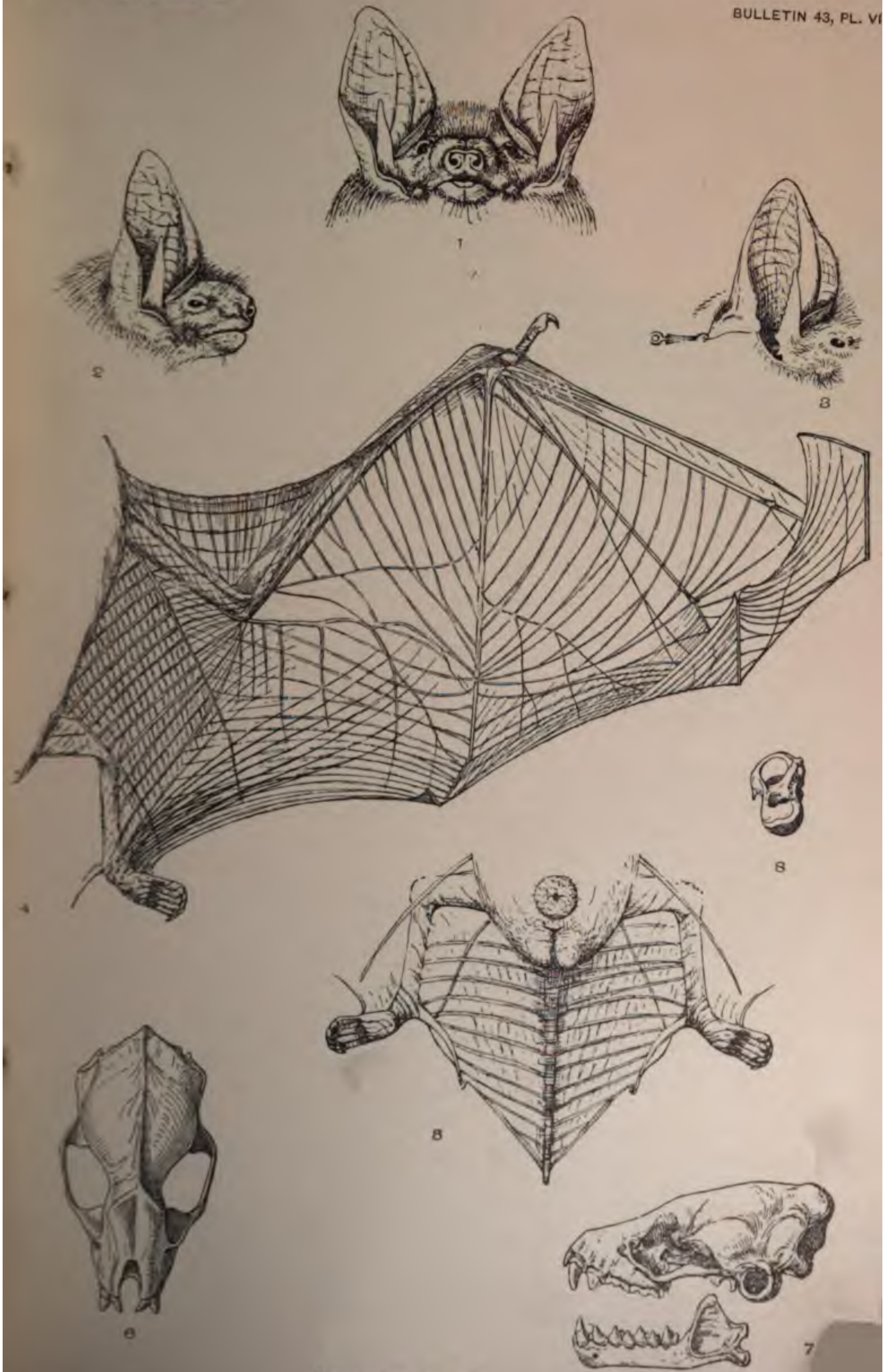
I propose presenting each of these subjects in some detail under distinct headings, as follows:

Pedomorphic variation.—In young bats the foot and thumb are apt to be disproportionately large as compared with the same parts in mature individuals; at the same time the auricle and tragus are correspondingly small, the snout high, blunt, and nearly naked. This disposition for our species occasionally to retain juvenile peculiarities has led to much confusion in their identification. Prof. E. D. Cope has proposed to employ for this condition the term retardation, that is to say, the parts above named are, as it were, held back while others are permitted to go on to adult expression. *V. lucifugus* of Leconte is a pedomorphic variety of *V. gryphus* as *V. yumanensis* is a similar variety of *V. nitidus*.

It is easily understood how necessary it is to determine the age of a given specimen to be identified, since an immature form of the typical example of a species may be similar to the fully grown adult from the retardation of development in the characters above named. In quite young individuals the fourth and fifth digits are of the same length while the basi-occipital bone is not coössified with the sphenoid, and the epiphysis at the distal end of the metacarpal bone, as well as both ends of the humerus, are detachable. In older specimens, yet immature, the proportions of the manus are as in the adult while the joint last named is still without sharpness of outline, thus indicating imperfection in development. The interfemoral membrane is triangular, the tip of the tail boldly exserted, and the post calcaral lobe is absent. The teeth are fully erupted long before the tail and the manus are complete, so that the characters presented by them are of little value in determining age after the animals become independent food-seekers. The study of the young, therefore, is of importance in the identification of species. Mr. J. A. Allen (Mammals of Massachusetts) has stated that in his judgment *V. lucifugus* is the young of *V. subulatus*, a statement which is equivalent to saying that bats having the characteristics above developed are always immature. I have, therefore, taken pains to examine carefully the composition of the bones in the forms which I have included in the monograph under *V. lucifugus*, and I can definitely assert that they are not immature. With the exception of the characteristic retention in the head, foot, thumb, and interfemoral mem-

EXPLANATION OF PLATE VIII.

FIG. 1. Front view of head of *Antrozous pallidus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIG. 8. Os petrosa.



ANTROZOUS PALLIDUS.

V. subulatus Harlan, Fauna Americana, 1825, 22 (not Say); Richardson, Fauna Boreal. Amer., I, 1829, 3; Godman, Amer. Nat. Hist., I, 1831, 71; Cooper, Ann. Lyc. N. Y., IV, 1837, 61; De Kay, Nat. Hist. N. Y. (Zool.), 1842, 8; Wagner, Schreb. Säugeth. V, 1855, 750, Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 436; H. Allen, Monog. N. A. Bats, 1864, 51; Dobson, Cat. Chirop. Brit. Mus. 1878, 324.

As indicated by the synonymy, this bat is the same as the *V. subulatus* of the first edition of the Monograph.

Maj. Leconte rehabilitated *V. subulatus*, Say, (see Appendix), and subsequent writers accepted this writer's determination. The type is lost. The original diagnosis was remarkable in four respects: It described the lower canine as bifid on one side—an anomaly I have never seen; it was drawn up from an immature individual; it was of a dull cinereous color on the dorsum, and had hairs on the free border of the interfemoral membrane. The specimen was secured on the Charles River, one of the sources of the Arkansas, in a section now near Pueblo in southwestern Colorado.

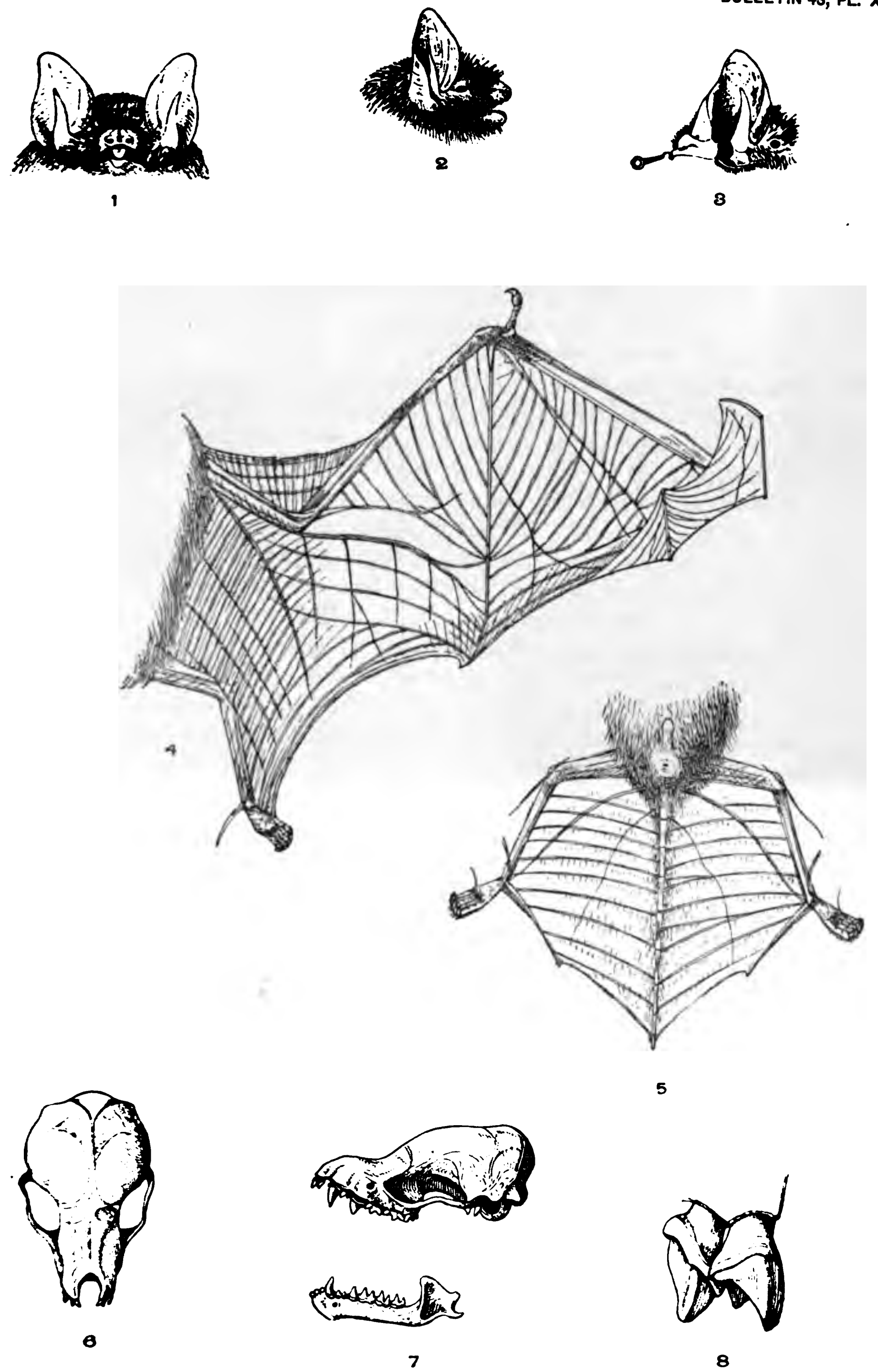
The only specimens of *Vespertilio* which have been described from regions near the one described are *V. nitidus macropus*, nob., which was obtained from Fort Whipple, Ariz., and *V. nitidus ciliolabrum*, Merriam, which was collected in western Kansas.

In one of the four specimens of *V. nitidus macropus* in my possession the color of the fur might easily be said to have a grayish cast, though the predominant color is brown. The question at once arises, can a specimen of *Vespertilio* collected in southwestern Colorado on the eastern slope of the Rocky Mountains be said justly to be the same as those which frequent the Eastern and Gulf States? I believe this question must be answered negatively, so long as I hold to my present opinion that western and eastern forms are distinct. It is agreed that the ninety-eighth parallel represents the line which separates the two sections, and since Charles River lies well within the western section, there appears to be no longer a doubt that *V. subulatus* is western in its affinities. Since the description of Say, therefore, can not apply, it is necessary to determine which of the numerous names given to the eastern form is available.

The diagnoses of Fr. Cuvier (*l. c.*) might all apply—three of them to the Northern (*V. gryphus*, *V. salarii*, and *V. crassus*) and three to the Southern varieties (*V. creeks*, *V. georgianus*, and *V. subflavus*). *V. georgianus* was sent to Cuvier by Maj. Leconte and the name was accepted by the donor of the specimen as applicable to the form described in this memoir under the name *Vesperugo carolinensis*. Of the remaining species it would appear to be appropriate to select the first in the order of the description. If this plan be accepted *Vespertilio gryphus*, Fr. Cuvier, is the name of the eastern species. The term "murinoid" of this writer happily gives the reader a clue to the affinity of the species, since *Vespertilio murinus* of Europe resembles our species of *Vespertilio* in many respects. The presence of two additional molars in the upper jaw as contrasted with the number in *V. creeks* the "serotinoid" bat *i. e.*

EXPLANATION OF PLATE X.

FIG. 1. Front view of head of *Vespertilio gryphus*.
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIG. 5. Maxillary incisors. x 32.



VESPERTILIO GRYPHUS.

a *Vesperugo* or an *Adelonycteris*, which have "no false molars above and but one below" is in direct testimony that this writer treated the last premolar as a molar and the smaller premolars as "false molars." The language implies the same as the modern expression that there are two minute premolars in each jaw in the *Vespertilio* and but one minute premolar in the lower jaw of *Adelonycteris*.

The following embraces the salient points in Temminck's account of the coloration in *V. caroli:* "Joues, côtés du cou et toutes les parties supérieures d'un brune-roussâtre à base des poils noire; en dessous d'un blanc jaunâtre à la pointe et brun-foncé à la base."

Diagnosis.—Subacuminate, tapering ears. Interfemoral membrane below the level of the ankles triangular; tip of tail exsert; penis large, with distinctly expanded but concealed glans; prepuce never pigmented. Lateral maxillary incisor disposed to outward rotation, almost always with crenulated cingulum. The face broad, from 9^{mm} to 10^{mm} between the ears, and, owing to the presence of large muzzle-glands, giving the region in front of the eyes a swollen appearance. A supralabial groove not distinctly inclines toward the mouth anteriorly; gape of mouth rarely extends back beyond the internal canthus. The tragus is slender and pointed; the inner border is straight, with the outer border inclined outward, thus forming two sides of an isosceles triangle. Above the notch the tragus is falciform and turned outward. It is rarely crenulate on the outer border. Membranes incline to be brown above (never black excepting in the lucifugan variety) and gray with tawny shades below. The hair on the dorsum of the interfemoral membranes ends abruptly at the level of the knees. Manal formula variable. The following are expressions of it:

First interspace	1 2½
Second interspace	8 11
Third interspace	23 23
Forearm	35 35

Description.—The auricle is elongated, with slightly acuminate internal basal lobe, and moderately convex anterior border and rounded tip. The external border directly below the tip and for a short distance is emarginate. The first scallop is distinct; the second indistinct, and the ridges are scarcely developed. The external basal lobe is rounded, small, incurved as a rule, thickened, and broader than high. The internal and external basal lobes lie near together, while the two borders of the auricle lie far apart. Hence the form of the ear is that of an oval, the lower external part being concealed by hair. Both sides of the auricle in well-preserved examples are marked by numerous raised arborescent lines; no transverse plicæ, such as are often conspicuous in the ears of bats, are here, as a rule, noticeable.

The tragus is acuminate, the anterior border straight, the external oblique, the widest part of the tragus being just above the small semicircular notch; the external basal lobe with a disposition to turn inward, *i. e.*, toward the interior of the auricle.

The sides of the muzzle with well-developed glands, which give the face a swollen appearance. The chin is provided with a triangular naked space whose apex is often slightly prolonged; the nostril with nearly central septum, and separated from the mouth by the width of the labial border only.

The wing membrane extends to the base of the toes; the tip of the tail is moderately exsert. The postcalcaral lobe slightly developed or absent.

The fur of the back is of a prevalent dark brown or olive brown color; basal third, plumbeous black. The brown color is apt to be somewhat lighter on the head and base of the ears than elsewhere. It varies in character, being sometimes dark brown and often light, or shades with admixture of russet, yellow, and even of gray. The basal two-thirds may be smoky brown instead of dark plumbeous. The under surface of the body is of a light gray, verging to tawny shades; the basal two-thirds of the hair is black. The skin from chin to a point as far back as the oral angles scarcely lighter in color than the rest of the body.

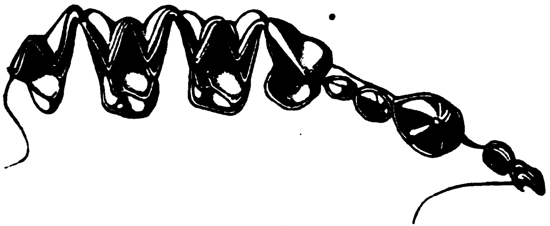
The melanic variety of *V. gryphus* is much less common than with *V. nitidus* or *V. albescens*. A good example of it is seen in a specimen in the United States Department of Agriculture (No. 23276, from Cherokee, N. C.). The dorsal brown is of so deep a hue in this example as to appear black in alcohol.

The variations of *V. gryphus* are two in number, as follows: (*a*) The pedomorphic forms (See p. 73), examples of which can be found in any of the geographical varieties and find their best expression in the *V. lucifugus* of Leconte; (*b*) a geographical variety confined to northern parts of the United States and Canada, and not embraced in other groups.

Var. (*a*)—**Vespertilio gryphus lucifugus** (Leconte).

V. lucifugus Leconte, Cuv. An. Kingdom (McMurtrie's ed,), I App. 1831, 431; *Ibid*, Proc. Acad. Nat. Sci. Phila., 1855, 436; Dobson, Cat. Chirop. Brit. Mus., 1879, 328; Alston, Biol. Centrali-Amer., Mam., 1879–'82, 25.
V. crassus Fr. Cuv., Nouv. Annales du Museum d'Hist. Nat., 1832, 15.
V. brevirostris Max. Prince von Wied, Verzeich. Beobach. Säugeth. N. A., 1860, 19.

Description.—Head rather large, somewhat flattish; lips moderately whiskered; snout more obtuse than in other varieties of *Vespertilio*; nostrils sublateral, some distance from free border of upper lip; ears narrow, blunt at tip, slightly emarginated on outer side—the internal basal lobe produced, rounded, and somewhat obtuse, not thicker than other portions of ear. Tragus half as high as auricle, mostly blunt, unfrequently abruptly acuminate. Mental space well defined. Feet large; inter-



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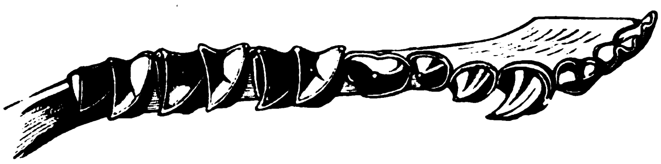

2

1. Maxillary teeth of Vespertilio gryphus. X 12.
2. Mandibular teeth of same. X 12.

femoral membrane of moderate size; termination of calcar with interfemoral somewhat abrupt; the point of tail exserted.

Coloration subject to little variation, that of the back dark plumbeous at base, with dark or lightish olive-brown tips; that of the belly lighter at tip—exhibiting a whitish gray or yellowish gray appearance. The color is thus similar to that of *V. gryphus.*

The narrow blunt ear, short face, and the elevation of the nostril above the free margin of upper lip are the characters which serve to distinguish this subspecies.

V. daubentonii, of Europe, bears some resemblance to this subspecies in the shape of the ear and tragus; but it is dissimilar in the whitish color of fur beneath, and in the attachment of the wing membrane to foot, which is here joined to the ankle instead of the base of the toes as in *V. gryphus lucifugus.*

The specimen, numbered 5538, from the east of Colville, Northwest Territory, has a pointed tragus, and the middle part of the free border of the interfemoral membrane fringed with stiff hairs. The fur of the body is silvery beneath, blackish above, back of feet not hairy. Another form from St. Louis, Mo. (Cat. No. 5344), has the wing membrane attached to the ankles—the foot being entirely free. In other respects both agree with *V. gryphus lucifugus.*

I have thought it necessary to thus briefly indicate these two aberrant individuals, without giving any separate account of them. Should future collections bring forward any others having the same peculiarities as the above.

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5336	1.10	1.5	1.5	0.7	2.6	0.2½	0.6	0.2	9.0	Alcoholic.
	1.9	1.5	....	0.6½	2.4	0.2½	0·6	0.3	8.6	Do.
5353	1.9	1.6	1.4	0.4	2.5	0.3	0.7	0.3	8.0	Do.
5347	1.9	1.6	1.4	0.4½	2.5	0.3	0.6½	0.3	8.9	Do.
5376	1.9	1.6	1.4	0.4	2.5	0.3	0.7	0.3	8.9	Do.
5401	2.0	1.6	1.7	0.8	2.6	0.3	0.7	0.4	10.0	Do.
5364	1.6	1.3	1.3	0.6	2.3	0.3	0.6	0.3½	8.0	Do.
5377	1.9	1.3	1.3	0.7	2.2	0.2½	0.6	0.3	9.0	Do.

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by	Nature of specimens.	Collection.
5376	1	James Bay, Hudson's Bay	C. Drexler	Alcoholic.	U. S. Nat. Mus.
5335	1	Westport, N. Y	S. F. Baird	do	Do.
5334	2	do	do	do	Do.
5336	3	Foxburg. Pa	do	do	Do.
5338	1	Washington, D. C	do	do	Do.
5337	2	do	C. Gerard	do	Do.
7197	1	Beaufort, S. C	Dr. Hayden	do	Do.
7198	1	do	do	do	Do.
5319	1	Isle Royale, Lake Superior.	B. A. Hoopes	do	Do.
5354	1	Detroit River	S. F. Baird	do	Do.
5501	1	Grosse Isle, Mich	Rev. C. Fox	Dry	Do.
5500	1	do	do	do	Do.
5505	1	do	do	do	Do.
5373	1	Wisconsin	A. C. Barry	Alcoholic.	Do.
5498	1	Racine, Wis	Dr. P. R. Hoy	Dry	Do.
5349	5	Cook County, Ill	R. Kennicott	Alcoholic.	Do.
5497	1	do	do	Dry	Do.
5347	2	Cairo, Ill	do	Alcoholic.	Do.
5363	1	Fort Pierre, Nebr	Dr. Hayden	do	Do.
5379	1	Santa Fé, N. M	W. J. Howard	do	Do.
5374	2	Cantonment Burgwyn, N. N	Dr. Anderson	do	Do.
5361	5	Puget Sound, Wash	A. Campbell	do	Do.
5366	3	do ?	Dr. Suckley	do	Do.
5378	2	Fort Steilacoom, Wash	do	do	Do.
5299	1	Columbia River	United States Exploring Expedition.	do	Do.
					Do.
5403	2	Fort Reading, Cal	Dr. J. F. Hammond	do	Do.
5364	2	do	do	do	Do.
5383	2	Cape Flattery, Wash	Lieut. Trowbridge	do	Do.
5380	1	(?)	(?)	do	Do.
5377	1	(?)	(?)	do	Do.
5373	1	Aspinwall, N. G	Dr. S. Hays	do	Do.

In this connection it may be said that J. B. Tyrrell (*l. c.*) has collected this from as far north as the Hudson Bay. 4961, M. C. Z. from Arkansas is the most southern locality from which I have noticed it. The foot in this specimen is very large, viz., 1^{m} long; the base of toes are furnished with long hairs, the tibia is 17^{mm} long, and the external basal lobe of the auricle is not incurved.

Var. (*b*) Northern form of Vespertilio gryphus.

It is highly probable that this variety has been repeatedly described in numerous accounts of North American bats (see Appendix)· but for the reasons already given it is impossible to determine to which species of the earlier naturalists it should be assigned. It is found best expressed in the region of which the St. Lawrence River is the center. Specimens have not been found north of Canada, south of New York, nor west of Wisconsin.

The tragus is long (truly subulate) directly outward. The anterior border of the auricle is distinctly convex, the posterior border concave. Ears long, next to *V. albescens evotis* in size. They reach beyond the median line at mentum. The foot is small, scarcely one-third the length of tibia. No post-calcaral lobe, but an apici-calcaral lobe is well marked; the tip of the tail is exsert; the membranes are light-brown in color.

List of specimens.

Cat. No.	No. of specimen.	Locality.	Collection.
5285	1	Nova Scotia	U. S. Nat. Mus.
5286	1	......do	Do.
6729	1	Halifax, Nova Scotia	Do.
7253	1	......do	Do.
8188	1	......do	Do.
11629	1	Baysfield, Wis	Do.
	1	Woods Holl, Mass	Do.
5334	1	West Point, N. Y	Do.

Two specimens of bats have been examined from the far north. One of these is No. 11160 N. M., Rupert House, Hudson Bay. Immature. The fur is dark brown. The tragus is small. The other is No. 11189 N. M., Alaska. The ear is large, the tragus is subulate, and the proportions generally quite as in the southern forms. The fur is dark brown. The specimen is in very poor condition. It is placed provisionally with *V. gryphus*. It is nearer the gryphian than the nitidian forms, but can not be included in any of the above varieties. The ease with which the bats from British America can descend along lines of high elevation into the northwestern part of the United States renders it probaby true that a mingling here of eastern and western forms take place. At all events I find it sometimes impossible to identify many specimens collected in Alaska, the western coast of British America, western Washington, and Oregon.

A specimen which I have recently received from Dr. Merriam, obtained from Princess Charlotte Islands, belongs to the same category.

Membranes.—The predigital nerve in the fourth interspace appears from the side of the fifth metacarpal bone at about its middle and is larger than a postdigital opposite which it appears at the side of the fourth metacarpal. The transverse lines in the interfemoral membrane are nearer to each other near the base than elsewhere.

The muscular mass of the base of the fifth metacarpal bone (composed of the *flexor minimi digiti* and the *interosseous*) equals one-sixth the length of the bone. The metacarpal bones more distinctly defined on the dorsum than venter; the ventral aspect of the fourth metacarpal bone is the least distinct of any, owing to the fact that it is crossed by numerous minute fibers.

Maxillary teeth.—The maxillary central incisor caniniform, slightly larger than the lateral, and (owing to a high degree of development of the cingulum) is marked bifid at cutting edge. The lateral border of palatal surface with a basal cusp. Lateral incisor with a main conical crown, which is somewhat wavy in contour posteriorly. Cingulum low and broad on the posterior and lateral borders, but crenulated and disposed obliquely forward and upward to the median border of the tooth, nearly reaching the level of the main cusp-tip. The variable oblique cingule band constitutes a marked peculiarity of this and allied species. Both the central and lateral incisor are disposed to be turned on themselves. The central presents its labial surface obliquely toward the median line (see Pl. x, fig. 8); the lateral at a right angle, orn early so, to the central. The degree attained by this rotation constitutes the difference between the divergence of the parallel alignment of the main cusps. These peculiarities, according to Dobson, present characters which are of value in distinguishing species. But they appear to have no validity in American examples of Vespertilio.

Canine with a well-developed concavity on palatal surface, but without any on the posterior surface. Its anterior surface is trenchantly fluted near median border. Of the three premolars the first two are small, conical with well-defined cingula, the first with the larger. The second is usually in tooth line, but may lie back of it, and therefore not be seen from without. Molars have two supplemental lines extending from the commissure of the protocone to the apices of the subequal Vs. Rudiment of a heel is plainly discernible. The third molar with a rudiment of a posterior limb.

Mandibular teeth.—The first and second incisors crowded-trifid. The third massive, square, or rugged, due to irregular development of the cingulum, which nearly reaches the level of the obscurely trifid edge. Canine with well-defined posterior and lingual surfaces. The first and second premolars small, conical; the first the larger, the second sometimes thrown in a little of the axis of the series. The molars as in *Adelonycteris* and *Vesperugo;* the heel of the third molar with small, acute cusp. The cusps, seen from lingual aspect of the lower molars, sharp and well developed. The hypoconid slightly larger than the triangle composed of the protoconid, paraconid, and metaconid. The cingulum forms a little cusp on the posterior border of each molar.

Dental variations.—In a specimen from the mouth of the Colorado River (No. 11170, N. M.), the maxillary lateral incisor on both sides was much larger than the small unicuspid central; the last line of the second V of the third molar was absent.

In the main modifications are noted in the relation of the superior premolars and in the shapes of the superior lateral incisors. The premolars may be crowded so that the second is often not visible from without and even the first may be placed so far inside the line of the other teeth as to be scarcely seen. Both Dobson and Merriam accept this disposition as of specific significance. I can not concur. In examples of both *V. gryphus* and *V. nitidus* I find examples of this recession.[*]

The cingulum of the lateral incisor may be entire or lacking on median contour; the median flange may be crenulated or smooth; the palatal base may be wide or greatly restricted. After a careful search I remain of the opinion that the differences in the form of this unique tooth are not of specific significance.*

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[*] Dobson describes this arrangement as characteristic of *V. albescens*, and Merri of *V. ciliolabrum.*

In the teeth of individuals in whom the teeth are worn it is impossible to note distinctions in the relation of these teeth.

Skull.—The skull is nearly flat. The mesencephalon measures 3^{mm}. The length of the skull is 14^{mm} to 14½^{mm}. The greatest width is 8^{mm}, and the least width, viz., at proencephalon, is 4^{mm}.† The posterior impression of the temporal muscle is barely visible. A small sagittal line is seen over the mesencephalon, but no elevation anywhere. The proencephalon is seen at the vertex and is convex on the side. The vertex of the face with a linear groove which extends almost to the anterior nasal aperture. The fronto-maxillary inflation is rudimental and confined to the upper border of the orbit and does not involve the lachrymal region; no tubercle is present over the foramina. The lachrymal foramen is large and placed well in advance of the orbital foramen of the infra-orbital canal. The inner wall of the orbit is faintly convex. The infra-orbital canal is not defined inferiorly and the depression lies in a space between the eminence for the third premolar. The paroccipital process is produced as a spine, nearly as long as the occipital condyle, and projects below the level of the mastoid. The coronoid process is higher than the horizontal ramus. The masseter impression is brought well down nearly to the lower border of the horizontal ramus. The angle is produced, slender, and reaches slightly beyond the condyle. It is deflected so as to lie to the outer side thereof. A minute posterior spine is seen at the symphysis.

The following specimens exhibit some individual variations in the skull. The brain case is markedly elevated above the face. Greatest width, 7^{mm}; least width, 4^{mm}. A distinct tubercle overlies the orbital foramina.

M. 6072 N. M. The linear groove not quite reaching the anterior nasal aperture. The temporal impressions are well defined, leaving a convex triangle at the occiput. The upper border of the orbit is rather trenchant, no tubercle is present.

Pedomorphic forms from Georgia, M. 4380–2 N. M. A tubercle lies over the orbital foramina; a linear groove reaches the anterior nasal aperture; the sphenoidal tongue does not reach the tympanic bone.

The turbinals exhibit the following features: The encranial surface in all essential features as in *Adelonycteris*. The single ectoturbinal one-third the length of the first endoturbinal plate. As seen from above, the ectoturbinal is lodged in a concavity in the lateral surface of the preceding plate. The first endoturbinal is produced as far as the first premolar. The plate is of a pyriform figure as seen from above, and presents a truncate apex. The portion in advance of the transverse lamina is deeply concave below and overlies the maxilloturbinal. The second endoturbinal is of a triangular figure with a rounded apex. It appears to be lodged, when the parts are viewed superficially, on the median surface of the endoturbinal series. The third endoturbinal is the smallest of the three, and is contiuous with the upper portion of the first endoturbinal.

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*This little tooth can not be seen to advantage unless studied as a microscopic object. It is exceedingly difficult to draw. Mr. von Iterson has done the best possible. At my request Prof. Henry F. Osborn carefully examined this tooth. I hoped that he might recognize in it characters in common with those of the teeth to the extinct forms of micro-mammalia; but he assures me that nothing similar to it has been seen by him in his special studies in this group.

†In *V. nitidus ciliolabrum* the greatest width is 6^{mm}, the least width, 4^{mm}.

Notes on the skeleton.—Atlas with two depressions in front. Scapula. Superior vertebral angle on level with base of the coracoid, the end of which is simple, not tapering. Humerus with trochlea axial, epicondyle small, nodular, and placed in front of a deep fossa. Radius much compressed laterally. The central articular groove at proximal end narrow but deep, the median flange semicircular and without facet in front. Proximal rudiment of ulna filiform, free;* distal rudiment a perforate quadrate plate. Of the proximal ends of the metacarpal bones, the fourth has the least motion and presents a deeply excavated proximal surface; the fifth has most motion and presents a flat proximal surface. The third is slightly deflected toward the center of the manus. The third, fourth, and fifth metacarpal bones diminish slightly in length in the order of the bones named. Occasionally the fourth is slightly shorter than the fifth.

Habitat.—*V. gryphus* appears to be an abundant species in the northern and northeastern range of the United States and in the Mississippi Valley as far west as the ninety-eighth degree of longitude, but less abundant in the Middle and South Atlantic States. I have never collected it near Philadelphia. According to J. B. Tyrrell it is found in Canada east of the Rocky Mountains. The vespertilionine bats from northwestern British America and Alaska are of this species, modified, possibly, by breeding with northern forms of *V. albescens*. At least I can not otherwise determine them. See in this connection remarks, p. ——. Pedomorphic varieties straggle as far north as Hudson Bay. It appears to be a strictly pastoral species,† and is found aggregated in large numbers in caves in association with *Adelonycteris fuscus*, *N. humeralis*, and *V. carolinensis*. It is frequently mistaken for the species last named. Sometimes it is found clinging together in clumps under the bark of decayed tree trunks.

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*The study of the proximal end of the ulna must be made by dissection. The bones as usually prepared show none of the characters. The ulna ends "free"; that is to say, lies as a filament among the muscles of the forearm.

†The word "pastoral" is here used in contrast to "urbal." It is not collected in houses either in town or country, but in trees and in caves.

V. gryphus bears a close resemblance to *V. albescens*. The proportions in the main are the same. The thumb is of the same size in the two forms. The differences which obtain between the two species in the direction of the supralabial groove and the shape of the tragus are perhaps as trenchant as any. The region at which the species are collected appear to strengthen the contrasts; thus, the *V. albescens* of southern California are easily distinguished from the *V. subulatus* of New England and Canada, while the Texan examples are more difficult to determine. It is likely that the species is primarily tropical, and in its subsequent movements to the north it underwent modifications, one variety following the western northern and great plateau, and preserving most of the peculiarities of the type. Another variety follows the eastern path and ranges over the lower countries east and north of the Mississippi River. In Texas the two have scarcely separated. Material is wanting to prove the difference which may exist between the forms between eastern and western Texas. From the difference in altitude between the coastwise lands of the east and the plateau lands of the west variations in *Vespertilio* of the kind indicated might be expected to exist.

I have not been successful in detecting secondary sexual characters in *V. gryphus*. Little is known of the characters of the young (*i. e.*, with milk dentition) of this species. The fur of the venter is paler and more yellow than in the adult. While the postcalcaral lobe is almost absent, the metacarpal bones are relatively short and of a uniform length. The antibrachial membrane is less firmly bound down to the distal end of the forearm than is the case in the adult. The outlines of the legs are not sharply defined.

Measurements.

[U. S. N. M. 11320, Bayfield, Wis.]

	Millimeters.
Head and body (from crown of head to base of tail)	1
Length of arm	1
Length of forearm	54
First digit:	
Length of first metacarpal bone	1
Length of phalanges	6
Second digit:	
Length of second metacarpal bone	27
Length of first phalanx	1½
Third digit:	
Length of third metacarpal bone	39
Length of first phalanx	11
Length of second phalanx	9
Fourth digit:	
Length of fourth metacarpal bone	39
Length of first phalanx	8
Length of second phalanx	7

Measurements—Continued.

	Millimeters.
Fifth digit:	
Length of fifth metacarpal bone	39
Length of first phalanx	8
Length of second phalanx	6
Length of head	16
Height of ear	13
Height of tragus	9
Length of thigh	12
Length of tibia	16
Length of foot	9
Length of tail	35

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of forearm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
5382	1.6	1.4	1.4	0.7½	2.1	0.3	0.7	0.0	9.0
5384	1.6	1.4	1.4	0.7½	2.3	0.3	0.7	0.3	9.0
5346	1.0	1.4	1.4	0.7½	2.2	0.3	0.7	0.3	9.0
	1.8	1.4½	1.4	0.7	2.3	0.3	0.6½	0.3	9.0
5385	1.6	1.5	1.3	0.4½	2.1	0.2½	0.7	0.3	8.0
5370	1.6	1.4	1.2½	0.4½	2.2	0.3	0.7½	0.3	9.0
5383	1.6	1.5	1.4½	0.5	2.3	0.3	0.7	0.3	9.0
5352	1.10	1.8	1.6	0.5½	2.4	0.3	0.7	0.4	9.2

List of specimens

Cat. No.	No of specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5384	1	Nova Scotia	Dr. Gilpin	Alcoholic.	U.S.Nat.Mus
5370	1	Brunswick, Me	A. S. Packard	....do	Do.
5385	1	Elizabethtown, N. Y	S. F. Baird	....do	Do.
5385	1	Phillipsburg, Pa	A. Brakeley	....do	Do.
5382	1	Bradford, Pa	C. C. Martin	....do	Do.
5381	1	Meadville, Pa	J. F. Thickstun	....do	Do.
7196	1	Beaufort, S. C	Dr. Hayden	Dry	Do.
7197	1	......do	......do	....do	Do.
3721	1	Michipico, Lake Superior	C. A. Hubbard	....do	Do.
5355	1	Portage, Lake Superior	B. A. Hoopes	Alcoholic.	Do.
5351	1	Upper Mississippi River, Illinois.	R. Kennicott	....do	Do.
5312	1	Racine, Wis	Dr. P. R. Hoy	....do	Do.
5500	1	Gross Island, Michigan	C. Fox	Dry	Do.
5318	1	......do	......do	Alcoholic.	Do.
5338	1	Detroit, Mich	Capt. Gunnison	....do	Do.
5391	1	Brookville, Ind	Dr. R. Haymond	....do	Do.
5348	1	Southern Illinois	R. Kennicott	....do	Do.
5346	2	St. Louis, Mo	Dr. Engelmann	....do	Do.
5362	1	Sonora, N. Mex	Arthur Schott	....do	Do.
5435	1	......do.	J. H. Clark	Dry	Do.
5432	1	(?)	(?)	....do	Do.
5503	1	(?)	(?)	....do	Do.
5441	1	Sonora, N. Mex	J. H. Clark	....do	Do.

2. **Vespertilio albescens** Geoff.

Vespertilio albescens Geoff., Annales du Mus., 1805, VIII, 204; Temminck, Monog. Mammifères, 1840, II, 244; Peters, MB. Akad. Berlin, 1866, 19; Dobson, Cat. Chirop. Brit. Mus., 1878, 326; Alston, Biol. Centrali-Amer., Mam., 1879–1882, 24.

Vespertilio brasiliensis Spix, Simiarum et Vespertilionum Brasiliensium species novæ, 1823, 63, tab. XXXVI, fig. 8.

Vespertilio leucogaster Wied., Beiträg. Naturgesch. Brasil., 1825, II, 271.

Vespertilio nubilis Wagner, Schreb. Saügeth., Suppl. 1844, I, 534.[*]

Diagnosis.—A white ring of fur across the space between the angles of the lower jaw conspicuous in alcoholic specimens. Auricle translucent, plicæ usually present, but do not extend to the outer margin; the dorsal aborescent lines infrequently present. The tip of the tragus is never acuminate; the convex basal half often ends abruptly and is followed by a narrower terminal portion; the basal notch is defined by the convex portion and the external basal lobe; the external basal lobe is not antiflexed. The face is scarcely swollen. The forearm measures from 31½$^{\mathrm{mm}}$ to 46$^{\mathrm{mm}}$ long. The facial clump of glands is narrowed posteriorly; the supralabial groove does not extend to the mouth.

V. albescens, in its larger phase, closely resembles *V. gryphus*, from which it can be distinguished by the shape of the tragus and the shape of the clump of supralabial glands. When dwarfed, *V. albescens* closely resembles *V. nitidus*, from which it may be distinguished by the greater size of the thumb and foot. The membranes vary in color from bluish translucent black to dense opaque black. The anterior surface of the interfemoral membrane often whiter, that is to say, retains an appearance as though it were washed over with a milky fluid.

Vespertilio albescens, as seen by reference to the original description (see Appendix), was so named from the white color of the tips of the hair on the under surface of the body, a style of coloration in no wise peculiar. The general appearance of the pelage must have been somber, since the fur of the back is described as black, and that of the inferior parts obscure brown. As in the case with other original descriptions, it would be impossible, without examination of the type, to distinguish this bat from others in the fauna, and we are compelled to rely upon personal authority. Peters (M. B. Akad. Berlin, 1866, p. 19) rehabilitated *V. albescens*, but did not give a new diagnosis. He was content to point out the fact that *V. leucogaster*, Wied., and *V. nubilis*, Wagner, were the same as this species. Peters has been followed by Dobson, Alston, and J. A. Allen. The author last named extended its range from South America and Guatemala to Mexico.

Vespertilio brasiliensis, Spix, is described in terms similar to those of *V. albescens*, with the marked exception that the fur of the under surface of the body is black. But in a figure which accompanies the description, the color is of the same shade as is commonly seen in *V. albescens*. So far as the figure is concerned, no one would hesitate long in assigning Spix's form to the same species as Geoffroy's. I have examined specimens of *V. albescens* in the National Museum which have been received from the British Museum, and assumably are the same as those named by Dobson, that I am of the opinion that since in America no bat is known in which the fur of the under surface is black, that *V. brasiliensis* is the same as *V. albescens.*

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[*] The last two names are here included on the authority of Peters, who has examined the types.

It is important to ascertain the places of variation in this obscure species and a few notes on individuals are herewith appended. In No. 29840, Keeler County, Calif., collection of Agricultural Department, the foot presented the extreme measurement of 10^{mm} while the forearm was 35^{mm}, the length of the head and body 45^{mm}, and the tail 36^{mm}. Yet with these dimensions the thumb was 5^{mm} long only, and the postcalcaral lobe was absent. Of the phalanges of the manus those of the second row were scarcely shorter than those of the first, the greatest disproportion being noticed in the fifth digit when the lengths were as 8^{mm} to 5^{mm}. In No. 29855, Old Fort Tejon, Calif., *ibid.*, the individual was smaller. The forearm was 32^{mm} long, the foot $8\frac{1}{2}^{mm}$. The head and body was 39^{mm} long, the tail 36^{mm}, the thumb remaining the same, viz, 5^{mm}. There was no postcalcaral lobe. The differences in the relative lengths of the digits were greater than in No. 29840, in the third digit being 10^{mm} to $8\frac{1}{2}^{mm}$, in the fourth 8^{mm} to 6^{mm}, and in the fifth 8^{mm} to 4^{mm}. In No. 27974, ♂ Colorado River, Nevada, *ibid.*, the forearm was $31\frac{1}{2}^{mm}$ long, the foot 8^{mm}, the thumb 5^{mm}, the head and body 38^{mm}, the tail 29^{mm}; while the phalanges of the third and fourth were equal, in the fifth the proportions were as $6\frac{1}{2}^{mm}$ to $4\frac{1}{2}^{mm}$.

If these proportions were constant, specific distinctions could easily be drawn. But unfortunately they are not so, and no two individuals will be found to conform to any diagnosis for specific characters which I have endeavored to frame. The auricle varied in detail on the outer border, especially as to the width of the first scallop and the tip. Peculiarities probably obtain according to altitude, character of food, degree of humidity in the atmosphere, etc. In No. 28972, Lone Pine, Calif., collection of Agricultural Department, the proportion of the tail to the body was as 32^{mm} to 39^{mm}, a great contrast to the foregoing phase. In No. 31569, San Emigdio, Calif., *ibid*, the membranes and ears were black. The forearm was $36\frac{1}{2}^{mm}$, being the greatest length of any individual examined in the United States (one specimen from Mexico measured 41^{mm}). The thumb was remarkably small, being $4\frac{1}{2}^{mm}$, while the foot was $8\frac{1}{2}^{mm}$. The length of the body was 49^{mm} and that of the tail 43^{mm}, thus being ample. The phalanges were subequal excepting those of the fifth digit, where the values were as 9^{mm} to 6^{mm}. This variety is too large for the type of *V. melanorhinus.* It it like *V. albescens* in having bluish translucent wings as in the diagnosis, but differing in the presence of large yet delicate frame and in greater deposition of pigment. Some of the black phases are noted as being found in growths of juniper. Is it possible that it is a mountain variety and that *V. evotis* is a phase of the same? Alston (Biol. Centrali-Amer. Mam., p. 25) extends the range of *V. lucifugus* to Brazil and states that a specimen in the British Museum is so labeled. According to the views expressed concerning *V. lucifugus* under the head of *V. gryphus*, the lucifugan phase is a pedomorphic form. It is probable therefore that *V. albescens* has a pedomorphic form which can not be distinguished from the same form of the closely allied species *V. gryphus*. I have seen no such form, however, in collections made in the United States.

In the first edition of the Monograph, p. 56, I assign *V. lucifugus* a distribution as far south as the isthmus of Panama. I now believe that the Neotropical forms simulating *V. gryphus lucifugus* are examples of pedomorphism in *V. albescens*. C. H. Merriam identifies *V. lucifugus* (three specimens) in collections from Little Spring, at the north foot of San Francisco Mountain, Arizona.

Var (*a*).—**Vespertilio albescens evotis** (H. Allen).

Vespertilio evotis H. Allen, Monog. Bats N. A., 1864; Dobson, Cat. Chirop. Brit. Mus., 1878, 324; J. A. Allen. Bull. Am. Mus. Nat. Hist., 1893, v, 202; Merriam, Mammals of San Francisco Mt. Region, N. A. Fauna, No. 3, August, 1890, 46; Alston, Biol. Centrali-Amer., Mam, 1879-82, 1.

Description.—Head rather small; face pointed, moderately whiskered, snout produced; ears large, high, erect, oval, not turning outwardly, long, subacumite, slightly diverging tragus; thumb slender; foot of moderate size; ample interfemoral membrane; last joint of tail exsert. The membranes are of a light brown color, tending in some to a darker hue. Hair long and soft, plumbeous at base behind, with light brown tips inclined to yellowish toward the head. The fur in front is dark maroon or black at base, with whitish tips. The basal third of the ear is covered with hair at base; at the base of the interfemoral membrane behind a tuft of hair is seen. In two specimens the fur had a darker tinge, the tips behind being dark olive-brown, the base being black. This variety has the largest ear of any of the American species of *Vespertilio.*

The above description is copied (with the substitution of the word "variety" for "species") from the first edition of the Monograph, page 48.

Herein is embraced a group of forms which find expression in the highlands of Montana, Washington, Colorado, and Arizona, though sparsely found in California.

The auricle is large, ordinarily coördinated with long, straight, slender tragus, though this is not constant; posterior border of the ear not emarginated; the membranes are almost always black; the foot is small; the tip of tail, as a rule, is moderately exsert; postcalcaral lobe often present; pigment in the second digital interspace is occasionally absent.

List of specimens examined.

Catalogue number.	Number of specimens.	Sex.	Locality.	Collection.
4960				U. S. National Museum.
11192	1		Fort Union, Dak	Do.
5391	1		East of Colville, ——	Do.
8914	1		Arizona	Do.
31189	1	♂	Easton, Wash	Department Agriculture Deposit, U. S. National Museum.
18683	1	♂	San Francisco Mountain, Arizona.	U. S. National Museum.
28958	1		Owens Lake, California	Do
29090	1		Inyo Mountains, California	Do.
30302	1		San Joaquin River, California	Do.
29827	1		Old Fort Tejon, Calif	Do.
28934	1		Pahranagat Valley, Nevada	Do.
329	1		Belmont, Calif	California Academy of Science.
327	1		Lassen County, Calif	Do.
341	1		Lake Tahoe, Nevada	Do.

All of the above exhibit the white transverse line between the angles of the jaw, which has been accepted as a character of *V. albescens*.

No. 29827 has a fringe of hair on the free border of the interfemoral membrane. Say describes his *V. subulatus* (see Appendix) as being similarly adorned. This is given by Dobson (*l. c.*) p. 323, as one of the characters of *V. levis* Is. Geoffrey (1824) from Uruguay. In 311890 ♂, from Easton, Wash., the forearm measured 33^{mm}, the thumb 5^{mm}, the foot 8^{mm}, tibia 17^{mm}, ear 16^{mm} in height, tragus $8\frac{1}{2}^{mm}$, tail 40^{mm}. The phalanges of the third finger were equal, namely, 11^{mm}; those of the fourth subequal, namely, as 8^{mm} for first and 9^{mm} for second, and those of the fifth still further subequal, being 8^{mm} for the first and $6\frac{1}{2}^{mm}$ for the second. The post-calcaral and apici-calcaral lobes are absent and tip of tail not exsert. Ears and membranes intensely black. The shape of the ears (other than in length and color, and the general form of the interfemoral membrane) are quite as in *V. gryphus*. The coloration, especially of the front of the neck and the tragus are as in *V. albescens*. Is the variety modified by descent from the north and properly belongs to the eastern phase of *Vespertilio*, or has it come more directly from the south through *V. albescens?* I have accepted the latter hypothesis.

In four specimens of *Vespertilio* from San Francisco Mountain, Arizona, the United States Department of Agriculture, one No. 18693 ♂, adult, the forearm is 37^{mm}, ears 19^{mm} high, thumb 6^{mm}, tibia 17^{mm}, foot 8^{mm}, tail 33^{mm}, head and body 34^{mm}; two had no post-calcaral or apici-calcaral lobes, yet had exsert tail to the distance of 2^{mm}, and is named *V. albescens evotis*, while the other three, all adult females, were much alike in proportion of ears, thumb, feet, and forearm, and all were of the smaller ear form. One had post-calcaral lobes and scarcely any exserted tip to the tail; one, post-calcaral distinct lobes and distinctly exsert tip, while the third had no lobes, yet with distinct tip. Here *V. albescens evotis* is found in the same locality with the melanic form of *V. albescens*.

In No. 31189 ♂, Easton, Wash., the thumb is 6^{mm}, strongly hooked;

the forearm 33^{mm}, the tibia $17\frac{1}{2}^{mm}$, the foot 7^{mm}, the head and body 41^{mm}, and the tail 39^{mm}. The central incisor strongly inclined inward, lateral giving the appearance of diverging incisors. Ears scarcely emarginate, external basal lobe higher than broad, membranes black, space beneath lower jaw not white. This is the typical *V. evotis* of the monograph. It would certainly be a distinct valid species if the southern forms did not show tendencies toward *V. albescens*.

Var. (b). **Vespertilio albescens melanorhinus** (Merriam).

Vespertilio melanorhinus Merriam, N. A. Fauna, No. 3, 1890, 46.

The following is an abridgment of the original description of *V. melanorhinus:*

Glandular prominence between eyes and nose inconspicuous; tail a little longer than head and body, the extreme tip projecting, ears shorter than head, shallow external emargination; tragus long and slender, directed forward and outward; convex at lower two-thirds, and then rapidly becomes narrower, and is sinuate and slightly concave on upper third. Thumb about half as long as the foot. Foot medium. Interfemoral membrane furred above to a little beyond the middle of tibia; postcalcaral lobe small but distinct; upper part uniform, dull golden brown, except the lips and face below and in joint of eyes, which parts are abruptly black; under part paler, palest posteriorly. Ears, face, and membranes black; underfur everywhere blackish, allied to *V. ciliolabrum*, from which it differs in having shorter ears and longer legs and tail, as well as in color.

No. 18684, ♂, San Francisco Mountain, Arizona, forearm, 31^{mm}; thumb, 4^{mm}; foot, 6^{mm}; head and body, 41^{mm}; tail, 41^{mm}; tip delicate, scarcely exsert.

The following embraces a study of the type of *V. melanorhinus*:

	Millimeters.
First phalanx, third digit	$10\frac{1}{2}$
Second phalanx, third digit	$10\frac{1}{2}$
First phalanx, fourth digit	8
Second phalanx, fourth digit	8
First phalanx, fifth digit	8
Second phalanx, fifth digit	6

Basal, half of auricle furred. Basal, three-fourths of fur above deep black; apical fourth, bright shiny golden brown. The interfemoral membrane thickly furred to knees and sparsely so almost to ankles. The proportions of basal black diminishes toward the rump, but the hair even on the interfemoral is obscurely bicolored. Basal, three-fourths below black; apical, fourth white with a slight mixture of a tawny shade. The interfemoral membrane clothed nearly to the knee with the same character of hair as on the neck, chest, and abdomen; but the basal proportion of black diminishes in proportion. Under surface of lower jaw not white. The prepuce blackish.

In specimen Nos. 29809 and 29810, Walker Pass, California, collection of Agricultural Department, the space under the lower jaw was black; the forearm measured 37^{mm}, the head and body, 45^{mm}; the tail, 44^{mm}; the thumb, 5^{mm}; the foot, 7^{mm}.

	Millimeters.
First phalanx of the third digit	12
Second phalanx of the third digit	12
First phalanx of the fourth digit	9½
Second phalanx of the fourth digit	9½
First phalanx of the fifth digit	8½
Second phalanx of the fifth digit	6

V. albescens melanorhinus is essentially the same as the melanic form of *V. albescens*, excepting that the tips of the hair of the under surface of the body are whiter than is the rule with this species and the tragus is more than usually crenulated, and two of the situations are exceptionally deep near the basal part of the outer border. That the hair is disposed to be white on the under surface of the body is suggested by the names *albescens* and *leucogaster*. In a bat otherwise black, this contrast of color is striking.

Var. (c). **Vespertilio albescens velifer** (J. A. Allen).

Dr. J. A. Allen (Bull. Am. Mus. Nat. Hist., No. 1, p. 177, 18) has described a species of *Vespertilio* from Mexico, which he believes to unite the characters of *V. albescens* and *V. subulatus* (= *V. gryphus*). I have examined the skins upon which this diagnosis has been made and believe the form to be a variety of *V. albescens*. The following is the text of Dr. Allen's description:

Vespertilio velifer, sp. nov.

Size of *V. albescens*, with nearly the coloration of *V. nitidus* and the ears of *V. subulatus*.

Above basal two-thirds of the fur blackish, passing into dark broccoli brown at the surface; below much paler, the surface pale buffy gray. Pelage full and soft, extending on the membranes about as in *V. lucifugus*. Ears of medium size, similar in general form to those of *V. subulatus*, but rather narrower and more attenuate at the tip, the upper posterior third distinctly hollowed, the lower third abrubtly much expanded; tragus long, rather narrow, fully or rather more than half the length of the ear, the front border nearly straight, the posterior border slightly rounded as far as a little beyond the middle, then sloping gradually to the rather narrow, but rounded tip, with a distinct notch opposite the anterior base.

Wings from the base of the toes; calcaneum strongly developed, feet large; thumb short, stout, with a rather thick claw; tip of last caudal vertebra free.

Length of head and body (measurements from dry skin), 44^{mm}; tail, 33^{mm}; ear, from base of inner margin, 14^{mm}; tragus, 9^{mm}; forearm, 42^{mm}; thumb, 8^{mm}; third finger (metacarpal, 38^{mm}; first phalanx, 13^{mm}; second phalanx, 12^{mm}; third phalanx, 10^{mm}), 73^{mm}; tibia, 17^{mm}; foot, 11^{mm}.

Skull broad, rather short; basilar length, 14^{mm}; total length, 16^{mm}; greatest width, 10.5^{mm}; lower jaw (front border to condyle), 13^{mm}. First upper premolar about twice the size of the second, both placed on the inner border of the tooth row.

Type, 2696, ad., Sta. Cruz del Valle, Guadalajara, Jalisco, September 7, 1889, Dr. A. C. Buller.

Three specimens, one male and two females, and six additional skulls, Sta. Cruz del Valle, Guadalajara, Jalisco, September 7 and 8, 1889.

These specimens agree very closely in size and coloration and in all other characters, and represent an apparently new species, quite different from any heretofore described. Its large size readily distinguishes it from any other known Mexican or North American species of the genus, except *V. albescens* Geoffroy, which it appears to equal in size, while differing from it almost as widely as possible in coloration, and also greatly in the size and form of the ear and in the very differently shaped tragus. Fortunately a Maximilian specimen of *V. leucogaster* Wied., a species currently synonymized with *V. albescens* (see Dobson, Cat. Chirop., pp. 326, 327), in the American Museum, enables me to make a direct comparison of *V. albescens* with the present species.

I have received a bat from Mr. G. S. Miller, jr., who obtained it from Dalyura, Cal., which answers so closely to *V. albescens velifer* (J. A. Allen) as to be at least a variety of this subspecies. The free margin of the interfemoral membrane from the calcars to the tip of the tail is conspicuously fimbriated. The fur above is of a light tawny brown of the same shade as is met with in many Californian specimens of *Adelonycteris fuscus*. The under surface is tipped with white throughout, after a manner precisely the same as in *V. albescens*. The basal parts of the fur both above and below is intensely black.

Var. (*d*) **Vespertilio albescens affinis** (H. Allen).

Under the name of *Vespertilio affinis* in the Monograph of 1864 (p. 53) I describe an immature bat as follows:

V. affinis.—Head moderate, slightly depressed; face hairy; ears rather small, inner border convex, outer border concave. Tragus is subulate, about half as high as the ear, straight oninternal side, diverging on the external. Lip whiskered. Body robust. Feet long and slender; a few curved hairs at the base of the nails; wing membrane, attached midway to base of toes. Interfemoral membrane rather small; a little lobe at the termination of the calcaneum; point of tail exserted. Thumb rather large. Wing membranes dark brown, but thin.

Fur thicker behind than before and extending a slight distance on the interfemoral membrane. Color lustrous light chestnut brown above; the same color of a lighter shade, inclining to yellowish below. The base of the fur above and below is of a delicate fawn brown.

The dentition is the same as in *V. erotis*, the incisors being the same length, the laterals bicuspid.

V. affinis resembles *S. georgianus* (*Vesperugo*) in being about the same size and in the fur and membranes presenting the same general appearance. It differs from that species in having the ear more emarginated on the outer border; the tragus not blunt, nor as wide proportionately; the face more hairy and not so depressed; the reddish hue of the hair more decided; the fur thicker and less wavy. The dentition differs in there being $\frac{6}{6}$ molars, instead of $\frac{5}{5}$. *V. affinis* has also a narrower interfemoral membrane and a marked calcareal lobe. On the dorsum the basal third of fur chestnut brown, apical half two-thirds lighter brown. The venter basal third deep brown (quite a different shade than that of the dorsum), while the tips are of a light gray, verging to white. The membranes from the tarsus. The coloration and the attachment of the wing membrane to the foot distinguish this variety. For the standard which existed for species at the time it was described, warranted its being placed under a separate heading from *V. subulatus*. It is immature.

This variation differs markedly in coloration from any bat of the genus in the fauna. This alone should retain the form. It holds relatively the same position as the preceding variation and *V. nitidus longicrus*.

3. **Vespertilio nitidus** H. Allen. The Californian Bat. (Plate XII).

Vespertilio nitidus H. Allen, Proc. Acad. Nat. Sci. Phila., 1862, 247: Monog. Bats N. A., 1864, 60; Dobson. Cat. Chirop. Brit. Mus., 1878, 318; Alston, Biol. Centrali-Amer. Mam., 1879–1882, 24.

Vespertilio agilis H. Allen, Proc. Acad. Nat. Sci. Phila., 1866, 279.

Vespertilio volans H. Allen, Proc. Acad. Nat. Sci. Phila., 1866, 279.

Vespertilio californicus (?), Bachman, Journ. Acad. Nat. Sci., Phila., 1842, 280; Peale, U. S. Explor. Exped. (Mam.), 1858, 3.

Diagnosis.—Ears much as in *V. gryphus;* the first scallop equals in length the external border and tip; the external basal lobe tends to be higher than broad; the outer border of the tapering tragus convex at lower half disposed to be crenulated, the outer and inner border never forming the sides of an isosceles triangle. Tail ample, convex on lower margin. Tail subtriangular or obovate below the level of the ankles and the tip exsert only in the pedomorphic forms. The first metacarpal bone parallel to the second.[*]

It is a question whether *V. californicus* Bachman (*vide* Appendix) should be accepted as a name for this species. I have concluded that the description does not sufficiently identify it. It is simply known to have been a western bat (for the word *californicus* need not necessarily have meant in 1842 the State of California as now restricted) having vespertilionine features as shown in the "sharp nose" and "linear attenuated tragus." The "light yellowish-brown" fur suggests that it may be the same as *V. nitidus macropus.* Since the type specimen is lost I have thought best not to attempt to rehabilitate this species.

Description—Dorsum light or dark chestnut brown with individual variations of olive brown, tawny, or gray colors. The base of the hair is of a deep black except at the rump where it is unicolored. The sparse hair on the back of the interfemoral membrane usually extends as far as the level of the feet; it is occasionally confined to the region of the basal third of the tail. The under surface of the body is of a lighter shade of brown than the dorsum. The gray tints gradually increase from above downward and are conspicously developed at the pubis in some specimens. In the most marked examples of this tendency it

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[*] Alston (Biol. Centrali-Amer., 1879–1882, 24) gives the following differential diagnosis between *V. nitidus, V. nigricans,* and *V. lucifugus.*

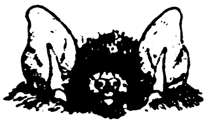
V. nitidus.—Ears as long as head; muzzle slender, pointed; thumb shorter than foot, which is small; tail wholly included in membrane. Forearm 1″. 20‴. Fur reddish brown above; reddish gray beneath.

V. nigricans.—Ears shorter than head; muzzle obtuse; thumb as long as foot. Forearm 1″. 30‴. Fur sooty rust-color.

V. lucifugus.—Ears as long as head. Forearm 1.″ 40.‴ Fur olive-brown, grayish below.

EXPLANATION OF PLATE XII.

FIG. 1. Front view of head of *Vespertilio nitidus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner side of auricle.
FIG. 4. Front view of head of *Vespertilio nitidus evotis.*
FIG. 5. Side view of same.
FIG. 6. Wing membrane of *Vespertilio nitidus.*
FIG. 7. Tail and interfemoral membrane.
FIG. 8. The skull seen from above of same. x 2.
FIG. 9. The skull and lower jaw seen from the side of same. x 2.
FIG. 10. A variant form of skull of same. x 2.
FIG. 11. The skull of *Vespertilio nitidus ciliolabrum.* x 2.



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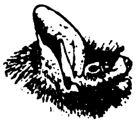

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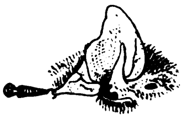

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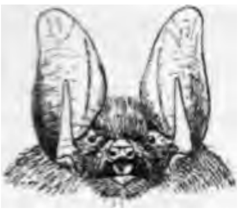

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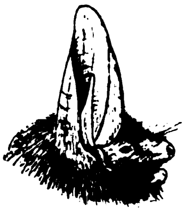

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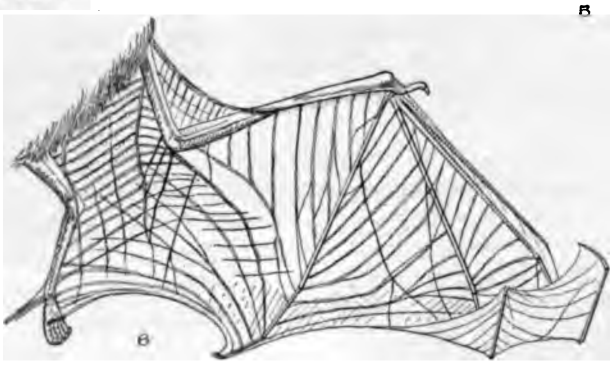

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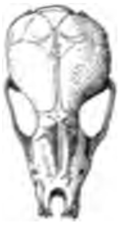

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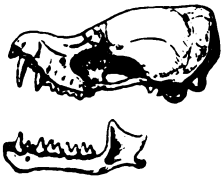

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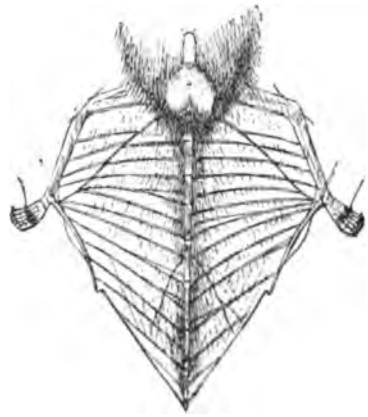

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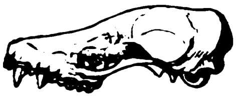

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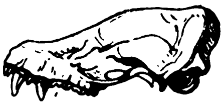

11

1, 2, 3, 6, 7, 8, 9. VESPERTILIO NITIDUS.
10. VESPERTILIO NITIDUS, VARIETY.

4, 5. VESPERTILIO NITIDUS EVOTIS.
11. VESPERTILIO NITIDUS CILIOLABRUM.

is less decided than in *V. albescens.* The gray color is also quite commonly seen at the space beneath the lower jaw as far back as the oral angles.

A scattered growth of gray hair occupies the ventral aspect of the wing membrane at its upper half from the body to near the elbow. The membranes are ample. The caudal series of vertebræ from the rump to the ankle one-third the distance from the ankle to the non-exsert tip. Postcalcaral lobe as a rule well developed and supported by a rod derived from the calcar. The length of the forearm ranges from 29^{mm} to 33^{mm}.

Variations—The variations of *V. nitidus* are numerous. They embrace changes in color of the fur, ear, membranes, and the proportions of the thumb, feet, legs, and forearm. Pedomorphic variation is extremely common. Before definite conclusions can be reached as to the limitations of the group elaborate study of more extensive material will be necessary.

The species of such distinguished writers as Dr. C. Hart Merriam and Mr. F. W. True can not be lightly put aside, and I am far from believing that the form *V. ciliolabrum* and *V. longicrus* are not additions to our knowledge. I place their descriptions, therefore, not in the Appendix, but in the text under *V. nitidus* where they find their proper place as subspecies or as members of groups otherwise aberrant, but not well known.

The specimens of *V. nitidus* from Mexico are of a reddish color on the dorsum. The foot, thumb, and tail as in California specimens. The length of the forearm is 28^{mm} to 29^{mm}; the head is two and one-half to three times as long as the foot; the tip of the tail is, as a rule, not exsert, the interfemoral membrane is ample. In a specimen from Jalisco, Mexico (American Museum of Natural History), the colors are everywhere darker; so dark, indeed, that at first sight it might be taken for a distinct form. Specimens from California are of four varieties of coloration on the dorsum, the chestnut, the olive, the tawny, and the gray; and are thus arranged in the order of the frequency of the several kinds. The tawny and gray are infrequently seen. Darker shades are apt to prevail toward the northern range of the Pacific slope.

Oregon and British Columbia have a nitidian bat not found elsewhere, viz, one in which the basal black of the hair is of a brown shade instead of black, and is thus not in so great contrast with the color of the tip as is the case with the southern specimens. The forearm is 31^{mm} to 36^{mm} long; the head one and one-half times to twice as long as the foot; the tip of the tail is exsert, the thumb measuring from 4^{mm} to 5^{mm}.

In a series of four skins collected by Mr. C. P. Streator (Am. Mus.) the dorsum was without the deep basal black, and in its stead an obscure shade of deep fawn which passed gradually to the ash or sooty tip. The venter was much more gray than in the southern examples.

The foot was large, equally one-half the length of the head; the post-calcaral lobe was absent. The caudal series from rump to ankle a little less than one-half the distance from the ankle to the tip. The length of the forearm ranged from 30^{mm} to 33^{mm}. This variety, therefore, may be accepted as pedomorphic. Immature specimens from Alaska appear to be of this variety. The color of a specimen from Beaverton, Oregon, is dark olive-brown, quite as in *Adelonycteris fuscus* with lighter shades anteriorly. Those from British Columbia are much darker, verging from dark gray to brown-gray.

Two specimens of *V. nigricans*, Nos. 3213 Panama and 4522 n. l. (Mus. Comp. Zoöl.), agree with the specimen from the American Museum of Natural History in having the foot 7^{mm} long. These do not materially differ from two specimens collected by Dr. Benjamin Sharp at Tobago, West Indies, in which the external basal lobe was broader than high, the fur black. I regret that the material at my disposal is not of a character which enables me to determine the precise relations obtaining between *V. nigricans* and *V. nitidus*. The vespertilionine bats of the west coast of the United States closely resemble *V. nigricans*. I am not sure but that *V. nitidus* must be accepted as a geographical variety of this South American form; practically there is no difference between the two varieties excepting the shape of the external basal lobe of the ear and the color of the hair of the dorsum, which is darkish gray to black in *V. nigricans* and reddish-brown in V. *nitidus*.

In a melanic specimen 28950, collected by C. H. Merriam, at Panaca, Nevada, (Collection of Agricultural Department), the leg measured 12^{m}, the forearm 37^{m}, the auricle 12^{m}, the foot 7^{m}, and the tragus 5^{m}, while the post-calcaral lobe was large, and the tail exsert. These proportions are quite different from those of the average *V. nitidus*.

In the dark sienna (almost black) brown of the back and the scarcely lighter shade of the same color of the chest and abdomen, a specimen collected at Queen Charlotte Island, by Mr. J. H. Keen, and kindly sent me by Dr. C. H. Merriam, no trace of white color marked the space between the lower jaw.

In No. 24223 ♂, Rosebury, Oregon (Collection of Agricultural Department), the same deep brown to black colors obtain. The tragus is semipyriform and of the height of the first scallop, which is conspicuously convex. The interfemoral membrane below the level of the ankles is triangular, with the tip of tail boldly exsert. The forearm is 32^{m}, the thumb 5^{m}, the tibia 15^{m}, the foot 8^{m}, head and trunk 39^{m}, and the tail 32^{m}. The upper lateral incisor is not parallel to the central. The external basal lobe tends to be broader than high and the space beneath the lower jaw, while less white than in the more southern examples, was not of the same color as the rest of the fur on the under surface of the body.

No. 24011 Blue Creek, Washington (Collection of Agricultural Department), closely resembles *V. nitidus*, but is of a uniform black color. The feet and interfemoral membrane are precisely as in the species named, but the thumb is larger and the external basal lobe a mere nodule.

V. agilis and *V. volans* which appear to be sufficiently distinct to warrant placing them in varieties of *V. nigricans*.* *V. yumanensis* of the Monograph of 1864 is undoubtedly an immature specimen of the same species. All the varieties of *V. nigricans* exhibit a disposition for the upper portion of the tragus to be crenulated; this is marked in *V. yumanensis*. In typical expressions *V. nigricans* from Brazil as well as the varieties from Peru (also described in the doubtful *V. oxyotus*, Peters) exhibit crenulations; the character, however, can not be relied upon as distinctive, since individuals of *V. gryphus* from eastern localities of the United States occasionally exhibit it.

Skull and *teeth* as in *V. gryphus*, excepting that the crenulated cingulum of the maxillary lateral incisor is less well developed.

Characters of immature specimens.—The colors of immature specimens, excepting the aberrant *V. yumanensis*, are more black on the dorsum than in the adult. The tips are obscurely and irregularly tipped with brown on the dorsum about in the same manner as the tips are silvery in *L. noctivagans*. On the venter the distribution of the gray tips is more uniform. The white color of the under parts of the jaw (seen also in *V. albescens*) is absent in the immature. In an individual 28^{m} long no fur was seen on the upper parts of the head and trunk except over the neck where a patch of olive brown hair was seen. The sides of the neck were also sparsely covered with hair of the same color. The under parts were thinly covered with very short whitish hair. The upper third of the interfemoral membrane and all the thighs were rather thickly covered with coarse olive-brown hair. The tips of the fourth and fifth fingers were marked by a few minute hairs. In an example measuring 32^{mm} the parts were marked as above but in addition the entire dorsum was uniformly covered with short olive-brown hair.

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* The varieties of *V. nigricans* embrace all forms which I described in the proceedings of the Academy of Natural Science, of Philadelphia, in 1886 (Notes on the Vespertilionidæ of Tropical America), containing the names of *V. mundus*, *V. cincinnus*, *V. exiguus*, *V. obscurus*, *V. exilis* and *V. tenuidorsalis*. I now look upon these provisionally described forms either as geographical or pedomorphic. The first four mentioned, namely, *V. mundus*, *V. exiguus* and *V. obscurus* belong to the dark variety, while *V. ciscinnus* resembles *V. nigricans* from the chestnut-red tints on the dorsal fur. *V. exilis* and *V. tenuidorsalis* again are of the *V. nitidus* type in the color of the dorsal fur. A due consideration of my statements in this paper would have clearly shown that these forms were never distinctly offered as species, but that they were submitted provisionally only under their separate names. It was hoped that the descriptions might be appended without confusion to the available meager diagnoses of the South American species. My position in this matter has been misunderstood. If I had denoted these varieties by number, or any other arbitrary means, it would have been to my mind as significant as naming them. According to the method of the Nuttal Ornithological Club of naming geopraphical subspecies by trinomials some of these names may get be available in studies of *V. nigricans* and *V. nitidus*.

The likelihood that tropical species of *Vespertilio* extend their range along the entire western coast makes it desirable to have exact knowledge of the South American forms. With the exception of *V. albescens* (which is undoubtedly distinct from *V. nigricans*) I have no acquaintance with these species. *V. polythrix* and *V. oxyotus* are probably synonyms of *V. nigricans*.

Habits.—Our knowledge of the habits of *V. nitidus* and its varieties is very scanty. As above stated I think it likely that when all the facts concerning this species and its associates are collected that it will be found that it is very close to, if not identical with the forms now known as *V. nigricans*, *V. chiloensis*, etc. It is warrantable, therefore, under such an assumption to include all notes of the habits of these and of specific descriptions of individuals which may be shown to be synonymous herewith.

V. chiloensis in an islandic variety. Bats can readily take flight from the mainland to an island of greater distance than Chiloe (vide *L. noctivigans* and *Atalapha cinerea*). In commenting on the habits of *V. chiloensis* Darwin says: "It is not, I believe, common, nor do the humid and impervious forests of that island (Chiloe) appear a congenial habitation for members of the family. It must, however, be observed that even in Tierra del Fuego, where the climate is still less hospitable, and where the number of insects is surprisingly small, I saw one of these animals on the wing." The description and figure of *V. chiloensis* Waterhouse (Zoöl. Voy. Beagle, Mammalia, 1838, 5) answers very well (except that it is without gray color of fur on the inferior surface of the body) to *V. nigricans.* Many specimens, which I have examined from California and Oregon, could not be, in the main, better described and delineated.

The dark hues of *V. chiloensis* recall those of examples of *V. nitidus* which have been collected in Oregon. Is the humid character of this portion of the coast-wise range sufficient to account for the difference in coloration from the Californian varieties? It would appear to be true that the lighter shades of brown and gray are associated with dry, hot plains and the darker hues with forests, especially when these cover high hills or humid mountains. Unfortunately nothing is said upon this subject by collectors. The nature of the food, so important a factor in preserving coloration in mammals and birds, is also never vouchsafed. While we know in a general way that the species with its congeners are insectivorous, the kinds of insects selected is unknown. From the large numbers of immature forms (as compared with the adult) in the Merriam collection I assume that many were obtained either from caves or hollow trees.

Melanic and pedomorphic forms of *V. nitidus*, as already remarked, are common. A careful examination of the materal recently collected by W. S. Bryant in Lower California, for the California Academy of Science, and by C. Hart Merriam, for the Agricultural Department, has not resulted in bringing the confusion which exists in my mind respecting *V. nitidus* into order. In specimens collected from the State of Washington to the lower part of Lower California, the same disposition prevails, namely, to have a bat with a forearm ranging in length from 30^{mm} to 35^{mm} in length; a small, delicate thumb not exceeding 3^{mm} to $3\frac{1}{2}^{mm}$ in length, and a long, delicate tail and nonexsert tip parts, which conform to *V. nitidus* (nob.), intermingling with other phases in which the thumb is much larger viz, 4^m to 5^m, the tail small and more exsert, while the general size of the individual is much the same, that is to say, not indicative of any distinctive peculiarities in size.

Measurements.

	Millimeters.
Head and body from crown of head to base of tail	
Length of arm	6
Length of forearm	28
First digit:	
Length of first metacarpal bone	21
Length of first phalanx	1½
Second digit:	
Length of second metacarpal bone	25
Length of first phalanx	1½
Third digit:	
Length of third metacarpal bone	25
Length of first phalanx	9
Length of second phalanx	10
Fourth digit:	
Length of fourth metacarpal bone	25
Length of first phalanx	7
Length of second phalanx	6
Fifth digit:	
Length of fifth metacarpal bone	25
Length of first phalanx	6
Length of second phalanx	5
Length of head	14
Height of ear	10
Height of tragus	7
Length of thigh	12
Length of tibia	13
Length of foot	5
Length of tail	36

Measurements from first edition of monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5433	1.8	1.3	1.3	0.6	2.3	0.3	0.5	0.2½	8.0	Dry.
5432	1.8	1.0	1.3	0.6	2.0	0.3	0.6	0.3	8.0	Do.
5446	1.6	1.0	1.2	0.6	1.9	0.2	0.4	0.2	7.0	Do.
523	1.7	1.0	1.3	0.6	2.0	0.3	0.5	0.2½	7.9	Do.
5444	1.3	1.1	1.2	0.5	1.9	0.2½	0.4½	0.2½	7.0	Do.
525	1.7	1.2	1.3	0.6	2.0	0.3	0.4½	0.2½	7.7	Do.
1367	1.7	1.2	1.3	0.6	2.9	0.3	0.4½	0.3	(?)	Alcoholic.
5194	1.6	1.5	1.2	0.6	2.0	0.3	0.6	0.3	7.9	Do.
5540	1.7	1.4	1.2	0.7	2.3	0.3	0.5	0.3	8.5	Do.
5190	1.6	1.2	1.2	0.6	2.1	0.3	0.5	0.3	7.9	
5384	1.6	1.3	1.2	0.6	2.1	0.1½	0.6	3.0	8.0	Do.
	1.5	1.4	1.1½	0.6	2.1	0.2	0.6	3.0	8.6	Do.
5535	1.6	1.1	1.2	0.6	2.0	0.2	0.6	3.0	7.6	Do.
5536	1.5	1.6	1.2	0.6½	2.1	0.2½	0.6	3.0	8.0	Do.
5565	1.6	1.3	1.3	0.6	2.6	0.2	0.6	3.0	8.0	Do.
5534	1.4	1.2	1.1½	0.5½	2.0	0.1½	0.6	3.0	7.0	Do.
5637	1.5	1.3	1.2	0 6	2.3	0.2	0.6	3.0	8.0	Do.
5466	1.6	1.2	1.2	0.6½	2.1	0.2	0.6	3.0	8.0	Do.

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by.	Nature of specimen.	Collection.
5432	1	Guadalupe Cañon, N. Mex	Capt. J. Pope	Dry	U. S. Nat. Museum.
5436	1	Pecos River, Tex	do	do	
5394	1	Santa Fe, N. Mex	W. J. Howard	Alcoholic	
5536	1	East of Fort Colville	A. Campbell	do	
5583	6	Puget Sound	do	do	
7004	1	do	do	do	
5368	1	Fort Steilacoom, Wash	Dr. Geo. Suckley	do	
5535	1	do	do	do	
5444	1	do	do	Dry	
5446	1	do	do	do	
5434	6	do	do	Alcoholic	
7005	1	San Francisco, Cal	R. D. Cutts	do	
5437	1	Monterey, Cal	W. Hutton	do	
1207	1	do	A. S. Taylor	do	
5368	17	Fort Tejon, Cal	John Xantus	do	
5405	1	Fort Yuma, Ariz	Maj. Geo. H. Thomas, U. S. A.	do	
5537	2	do	do	do	
5533	1	Cape St. Lucas	John Xantus	do	
5402	1	do	do	do	
5398	1	do	do	do	

Var. (a). **Vespertilio nitidus macropus** (H. Allen).

Vespertilio macropus H. Allen, Proc. Acad. Nat. Sci. Phila., 1866, 288.

The following is the description of this variety, provisionally described as *V. macropus*. Above, fur long, silky, three-fourths black, apical fourth uniform, light russet brown, a small clump at the base of interfemoral membrane. Beneath, same proportion as above, being at base black, at tip grayish-white, pure white at pubis; fur extends laterally on membrane midway to elbow. Wing membrane attached midway between base of outer toe and ankle joint. In other respects it closely resembles V. *subulatus*.

Measurements.[*]

Height of ear	6'''
Height of tragus	3½'''
Length of humerus	1'' 4'''
Length of thumb	3'''
Length of foot	4½'''
Length second joint index finger	1'''
Expanse	8'' 3''

This form has the light reddish brown color to the fur on the dorsal surface of the body as in the Sonoran varieties of V. *nitidus*. The foot is very large and the interfemoral membrane triangular below the level of the ankles and the tip of the tail is exsert. As above stated the resemblance to V. *subulatus* (V. *gryphus*) in this regard is close. *V. nitidus macropus* I believe to be a pedomorphic form of V. *nitidus*, but owing to peculiarities of environment retains the light yellow brown hues so common in desert living individuals.

Two other specimens were included in the collection sent me by Dr. Coues at the same time with the foregoing. I named these forms *V.*

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[*] Mature. Dr. Coues' private collection, near Fort Major, Colorado River, New Mexico. Dr. E. Coues, U. S. Army.

subulatus. I now believe them to be members of the same group with the next variety (q. v.) of *V. nitidus.*

Var. (b). **Vespertilio nitidus ciliolabrum** (Merriam). (Plate XII.)

Vespertilio ciliolabrum Merriam, Proc. Biol. Soc. Washington, IV., 1886–'88, 1.

The following is an abridgment of the original description of *V. ciliolabrum*:

Ear as long as the head; calcar occupies one-half the free margin of the interfemoral membrane; post calcar lobe large; apici-calcaral lobe developed; internal basal lobe slightly rounded; outer margin auricle sharply emarginated (concave) for about one-third of its entire length; first scallop at first abruptly convex, then straight; external basal lobe (reflexed lobe) distinct. Tragus as in all western forms. Thumb very small, considerably shorter than foot. Foot small. Half of last vertebræ free.

Fur long and soft; basal portion dusky, apical portion varying from whitish or yellowish white to isabella-brown (tawny-isabella in the New Mexico specimens), which in some individuals is nearly as dark as in *V. subulatus*; the colored apical portion varies in extent from less than one-third to more than one-half the length of the hairs.

Dr. Merriam believes *V. cililolabrum* to be allied to *V. nitidus.* The ear is larger and in other proportions, and in color it is distinct.

Habitat.—Trego County, Kans., and subsequently collected in Grant County, southwest corner of New Mexico. Mr. A. B. Baker the discoverer states that it was found in bluffs or canyons near the town of Banner and well hidden away in clefts in the chalk rocks. Others occupied abandoned swallows' nests which were inaccessible; but they were easily dislodged by means of stones. Mr. Baker has informed me that the locality for this subspecies no longer exists.

Measurements.

	2794 ♂ ad Merriam coll.	2797* ♀ ad. Merriam coll.	27055 Pahrump Valley, Neb.
	mm.	*mm.*	*mm.*
Head and body	42.	43.	39.
Head	16.25	16 25	....
Tail	37.	40.	39.
Ear from inner basal angle	15.	15.	....
Tragus	6.75	6.75	....
Humerus	22.	22.	....
Forearm	32.50	33.	31.
Thumb	3.75	3.50	4.
Third finger	56.	56	....
Fifth finger	44.	45.50	....
Tibia	11.25	11.50	13.
Hind foot	7.	7.50	5.
Width of second interspace	....	....	2.50
Width of third interspace	....	....	10.
Width of fourth interspace	....	....	27.

* Type.

In specimen No. 27061, Death Valley, California, the thumb is 3^{mm}; post-calcaral well developed, no apici-calcaral lobe; the tail is as long as head and body, ample, convex on sides; interfemoral membrane is sparsely haired to ankles above.

The upper first and second upper premolars are invisible from without; ears furred at basal one-half; tragus with distinct spine at upper border of the basal notch, and crenulated near tip. In all the forms the hair on the interfemoral membrane almost to the ankle; forearm, 30^{m}; hair deep black at base; light golden yellow to light brown above; white beneath.

The following list includes the specimens of this subspecies in the collection of the Agricultural Department:

27054 ♀ Vegas Valley, Nevada.
27055 ♀ Pahrump Valley, Nevada.
27056 ♂ Colorado River, Lincoln County, Nev.
27059 ♂ Death Valley, California.
27060 ♂ Death Valley, California.
27058 ♂ Death Valley, California.
27061 ♂ Death Valley, California.
27051 ♂ Amargosa River, California.
30731 ♀ East Fork Keweak River, California; dark chestnut brown above, light buff beneath.
30730 ♀ *Ibid.*

In specimen No. 2786 ♀ and No. 2787 ♂ collected by E. Coues at Fort Whipple in 1862, the outer margin of the ear scarcely concave, first scallop not sharply defined above; external basal lobe thick, rigid, sharply incurved. All parts of body and of membranes delicate, facial proportions slender, nose pointed. Interfemoral membrane above sparsely haired almost to ankle; post calcaral well developed; apici calcaral long, projecting. Tail 19^{m} to ankle; 17^{m} from ankle to tip; tip not exsert. Tail in 2786 straight to within three segments of end, then it is abruptly flexed. In 2787 it is curved throughout as in *Vespertilio* generally, and the apici-calcaral not projecting; post calcarals absent.

Here, in two examples, the contrast as to the lobes about the calcar and the shape of the tail is marked. The degree of hairiness on the upper surface of the interfemoral membrane is the same in the two sexes. I can not distinguish this form by any valid character from a group of specimens (five in all, 18776 to 18780, all females) in the collection of the Agricultural Department, from Oracle, near Tucson, Ariz.; one of these, No. 18778, is taken as a basis for the following notes:

Basal lobe not thickened at free border, scarcely incurved; the post calcaral lobe a mere hem; the membranes are not black; the glands on the side of the face swollen, ovate mouth cleft, not reaching the posterior canthus; the thumb 4^{m} long; the foot 5^{m} long; the head and trunk 38^{m}; the tail 35^{m} long, longer than body; forearm 30^{m}.

These examples are nearly identical with skins of E. Coues from Fort Whipple. Very light chestnut brown above, white beneath the jaw; tragus semipyriform; lateral incisor small and parallel to central interfemoral membrane, milky in front. This group of individuals exhibit characters combining those of *V. albescens* and *V. nitidus.*

lighter shade to the fur and a slightly smaller thumb would readily carry them over to *V. nitidus ciliolabrum.*

Two examples (No. 12450, U. S. N. M., both gravid females) collected by Mr. H. W. Henshaw, near Wingate, N. Mex., in 1872, presented such marked color phases as to suggest that if these prove to be constant in individuals collected from this portion of the country that a separate geographical subspecies of *V. nitidus* be based upon them and the somewhat similarly colored specimens from the Death Valley region. The fur is long, silky, nearly white above in one specimen, and brilliant light aureous in the second. Both specimens are quite white beneath. Interfemoral membrane hairy above nearly to ankle, the back of thigh and leg being covered. The general proportions are quite as in the type of *V. nitidus.* If subsequent observation confirms such subspecific determination, the name *V. nitidus Henshawii* may be given it. Mr. Henshaw was the first collector who brought this phase of vespertilionine life to the attention of naturalists.

Var. (*c*). **Vespertilio nitidus longicrus** (True).

Vespertilio longicrus F. W. True, Proc. U. S. Nat. Mus., 1887, 6.

The following is the original text of the description:

> Glandular prominences of the sides of the face well developed, as in *V. lucifugus*, making the muzzle appear blunt. Ears shorter than the head; laid forward they do not reach the nostrils by a millimeter; inner margin evenly convex from lobe to tip; upper third of outer margin scarcely conclave, lower two-thirds rather strongly convex. Length of the tragus slightly more than one-half the height of the ear; inner margin concave, outer margin convex, crenulate; tip rounded off.
>
> Wings from the base of the toes; foot less than one-half the length of the head. Tail long. Interfemoral membrane deep antero-posteriorly; the hinder margin straight in the posterior half. Calcaneum ending in a small rounded lobe in the middle of the hinder margin of the interfemoral membrane; the margin between this lobe and the foot very convex. Only the cartilaginous extremity of the tail free. Tibia very long, excelling the head by nearly one-fourth.
>
> The fur of the body extends on the interfemoral membrane along the tail as far as a line joining the centers of the tibiæ. The fur above uniform umber colored, or slightly lighter at the extremities; beneath, umber in the basal three-fourths, dull Naples yellow in the apical fourth. Membranes dull brown.
>
> Skull with the face very short and the brain-case greatly elevated. Teeth as in *V. lucifugus*, except that the first upper premolar is not crowded behind the canine.
>
> On account of the length of the tibia I have thought it appropriate to name the species *Vespertilio longicrus*
>
> It is evident that it is closely allied to *V. lucifugus*, but it is readily distinguishable from that species by its shorter and broader ears, longer tibiæ, smaller feet, and duller color.

Measurements of Vespertilio longicrus, 15623, Puget Sound.

	Millimeters.
Length of head and body	47.5
Length of head	16.0
Height of ear	12.5
Length of tragus	6.5
Length of forearm	39.0
Length of thumb	6.0
Length of tibia	20.0
Length of foot	7.5
Length of tail	45.0

In this species of Mr. True, the short ear, with its sharply concave outer margin, the short noncrenulate tragus, the dark color of fur on the under surface of the body, the long tibia, with triangular shape to the interfermoral membrane below the line of the ankles, separate this form from other bats which have been collected in the region of the northwest. If other examples sustain the peculiarities, *V. longicrus* is undoubtedly a distinct species. It is likely, however, to prove to be a variant of the eastern forms modified by migration to the north and west. In the event of this proving to be the case, it becomes a subspecies of *V. gryphus*. *V. longicrus*, while a member of the humid coast line of the west coast of North America, is unlike other individuals which have been collected from the same region. The peculiar excavation of the outer border of the auricle and the length of the tibia have not been repeated in other specimens.

Note on Vespertilio subulatus, Say.*—Attempts to rehabilitate *V. subulatus*, so as to admit it in the group of western forms, has proved to be as difficult as is the case for all the North American bats where the types are unknown. This is especially true of species described in the first half of the present century. To make the admission valid it is necessary that Say's description should answer to the descriptions of *V. albescens*, *V. nitidus*, or one of the subspecies of these forms. The reader must judge for himself with what degree of justice any of the names of the herewith defined forms, either reëstablished by acquaintance with types or secured by detailed description at the hands of accomplished zoölogists, should be put aside in order to restore a form which has been imperfectly described (see p. 187) from a single immature specimen.

Genus **LASIONYCTERIS** Peters.

Lasionycteris Peters, MB. Akad. Berlin, 1865, 648.
Vesperides Coues and Yarrow, Wheeler's Exped., Zoöl., 1875.

Diagnosis.—Ears with whitish internal basal lobe; outer border and outer basal parts with membranous flange. Tragus of peculiar shape, short, blunt, with straight inner and convex outer border. Face hairy. Wings to base of toes; no calcaral lobe or tip; tip of tail exserted. Foot and thumb of one length and a little less than one-fifth as long as the forearm. Hair dark, plumbeous or blackish, with tips conspicuously dashed with gray or white. Dorsal four-fifths of interfemoral membrane with numbers of minute warts arranged transversely and furnished with a sparse growth of hair. The first phalanx in the third, fourth, and fifth fingers longer than the second.

Dental formula—molars $\frac{3}{3}$, premolars $\frac{2}{3}$, canines $\frac{1}{1}$, incisors $\frac{2}{3}$ × = 36 teeth.

The manal formula is as follows:

	Millimeters.
First interspace	1
Second insterspace	4
Third interspace	25
Forearm	37–38

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* For literature of *V. subulatus*, see p. 76.

Previous to the date of the Monograph of 1864, this genus had been embraced in *Vespertilio*. In considering it a species of *Scotophilus* I made an error. The difference in the number of the molars, the two genera, should have influenced me in not including the form in any of the genera known at that time. "The trifling difference in the number of the teeth does not afford a sufficient reason for considering them (the North American Vespertilionine species) as different" (Leconte). I was influenced by this opinion in not separating *Lasionycteris* from its congeners. While Maj. Leconte, a leading authority in his day, was so doubtful upon the subject of the value of the variations in the dental formula he placed great importance on the minute changes in form of the outer ear.

1. Lasionycteris noctivagans (Leconte). The Silvery Bat. (Plates XIII, XIV.)

Vespertilio noctivagans Leconte, Cuv. An. Kingdom (McMurtrie's ed.), I, June, 1831, 31; Cooper, Ann. Lyc., Nat. Hist. N. Y., IV, 1837, 59; De Kay, Nat. Hist. N. Y. (Zoöl.), 1842, 9, Pl. I, Fig. 1; Wagner, Schreb. Säugeth., Suppl., V, 1855, 754.

Vespertilio auduboni Harlan, Month. Amer. Jour. Geol. Nat. Hist., I, 1831, 220, Pl. II; *Ib.*, Med. and Physical Researches, 1835, 30, Pl. IV.

Vespertilio pulverulentus Temminck, Monog. Mam., II, 1835, 235; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 436; Max. zu Wied, Archiv Naturg., 1861, 192.

Scotophilus noctivagans H. Allen, Monog. N. A. Bats, 1864, 39.

Lasionycteris noctivagans Peters, MB. Akad. Berlin, 1865, 648; Merriam, Mamm. Adirondack Region, 1886.

Vesperides noctivagans Coues and Yarrow, Wheeler's Exped., Zoöl., 1875.

Vesperugo noctivagans Dobson, Cat. Chirop. Brit. Mus., 1878, 238.

Description—Ear oval. Internal basal lobe of dull yellow color which contrasts with the dark brown of the rest of the auricle. The free projecting lobe rather larger than in other species of the group. The lobe ends abruptly on the inner border, which is directed in an oblique straight line upward and backward to a blunt tip which is in the long axis of the auricle and is not directed backward. The upper part of the outer border is straight and bears a delicate fold which is turned back against the posterior surface of the auricle. The lower part is convex, also bears a delicate reverted fold, and is separated from the upper by a small notch. The external basal ridge does not reach the border of the auricle. It is irregular and bears two tubercles, between which lies a well-defined pocket. The external basal lobe is membranous and bears upon its inner surface a small nodule which is homologous to the reverted portion in *Adelonycteris fuscus*. The external basal lobe ends on a post rictal wart.

Thus the ear has a membranous expansion of variable width on the posterior border from the tip to the angle of the mouth.

Tragus short and blunt, straight on the inner border, slightly deflected outward at the outer border for a short distance, and is thence abruptly convex, to be gradually inclined inward at the pedicle. The outer surface of tragus is concave and suggests in a general way the plan in *Emballonura*. Glandular masses on side of snout conspicuous; they appear to advantage against the depression in the face directly back of them. Snout is broad, scarcely emarginate. Width between nostrils greater than distance from mouth to top of snout. Upper lip slightly pendulous at the side. Mental plate well defined inferiorly. Dobson states that the inner margin of the tragus appears to be in the angle between the free projection of the internal basal lobe and the conch. This must be an individual variation or an error of observation.

Dorsum fur long and silky, of a dark brown, black at the basal two-thirds or four-fifths, the apical portion becoming abruptly gray or white. The head and neck almost entirely brown-black, the silvery appearance not being sufficient to give character to the region. Occasionally the hair of the face, both above and at the sides, will be of the dominant color, while the crown and nape will be of the same character as the body.

Below the fur is of the general character of the dorsum, but slightly shorter. The postmental region nearly naked, the rest of the neck scarcely silvery, as on the dorsum of face.

The prebrachium with distinct tendon of occipito-pollical muscle. Three conspicious intercostal lines are discerned.

The coraco brachialis fascicles rises high up near the axilla. The triceps fascicle system with vertical oblique and horizontal lines discernible. None of the terminal lines of the foregoing, reach the free margin of the wing-membrane. No vertical lines apart from the foregoing are discernible. The obliquetibial line arises from near ankle and extends as far as the intercosto-humeral at the elbow.

A delicate forked line extends downward and somad from the lower part of muscle mass at the proximal end of the fifth metacarpal bone.

The fourth interspace exhibits the predigital nerve appearing in a well-defined elevated fold of membrane at the side of the muscle-mass just named. The line forms a curve and extends about one-half way down the shaft of the fifth metacarpal bone, when it is lost along the line of the shaft. The main branch of the nerve arises from the middle of the curve and passes downward and forward, but does not extend beyond the middle of the interspace, nor quite to its free border. The postdigital nerve arises high in the interspace, apparently from the palm, approaches the fourth metacarpal bone at its proximal end, but soon leaves it and is distributed to the anterior half of the interspace.

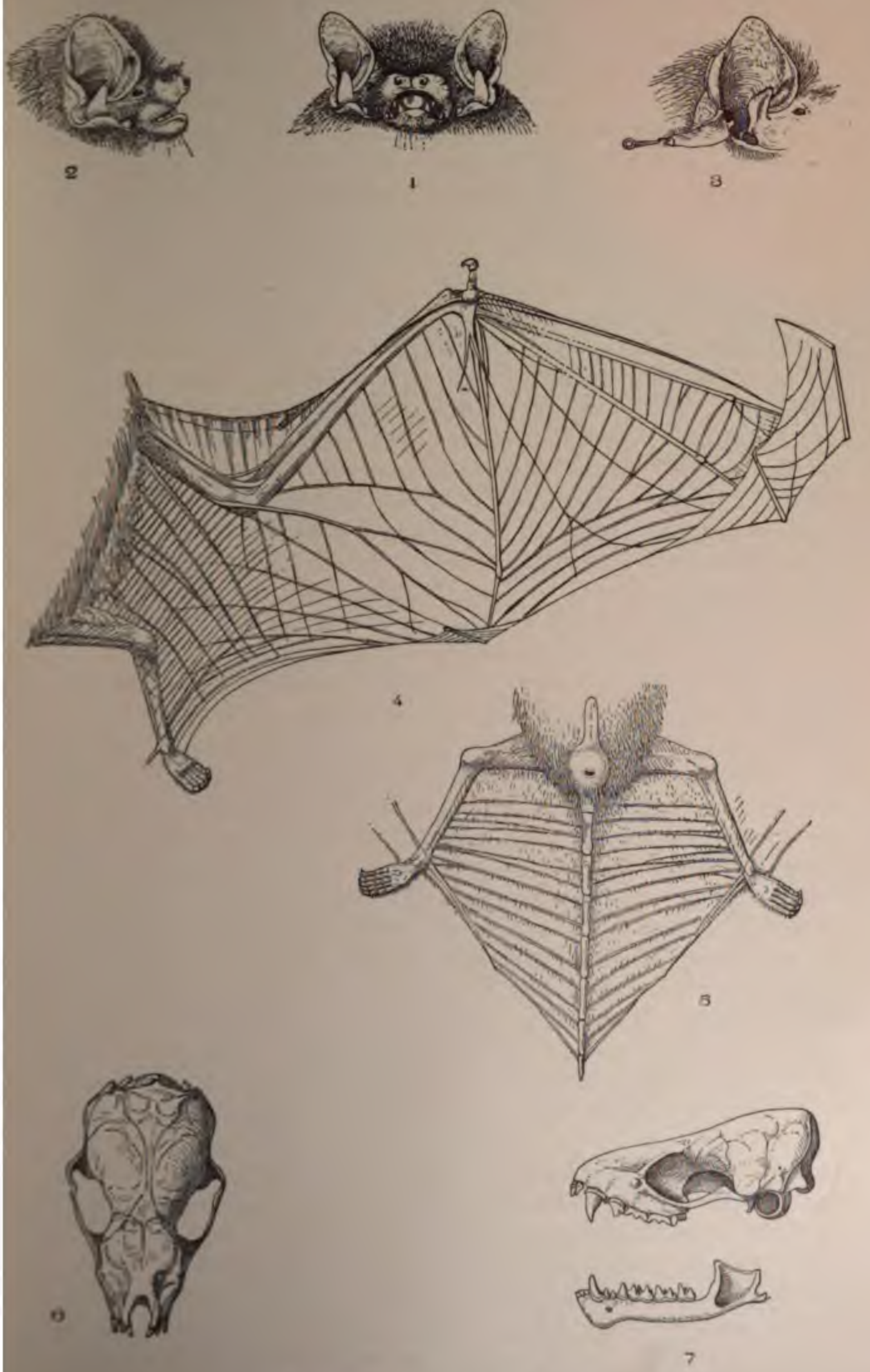
The third interspace shows a delicate line from the first interphalangeal joint of the fourth finger and a second longer one from the metacarpo-phalangeal joint of the third finger.

The interfemoral membrane shows the oblique line (above) as a caudotibial, since it arises from the side of first caudal vertebra. The transverse lines on the interfemora membrane are regularly disposed and marked with minute pilose warts.

The terminal phalanges much the same as in *Atalapha*. The parts are all delicate; the terminal phalanx of the third digit is sigmoid and

EXPLANATION OF PLATE XIII.

FIG. 1. Front view of head of *Lasionycteris noctivagans*.
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. The skull seen from above. x 2.
FIG. 7. The skull and lower jaw seen from the side. x 2.



LASIONYCTERIS NOCTIVAGANS.

less rigid than in any species examined. The tip of the terminal phalanx of the fourth digit is minutely lobed and free.

The dorsum of the interfemoral membrane sparsely covered with silvery tipped hair for four-fifths of its extent; the tibiæ are involved.

The wing membranes are attached to the base of the toes. The fifth metacarpal bone is shorter than the third and fourth, which are of the same length. No raised lines are present in the radio-metacarpal angle or about the muscle-mass at the base of the fifth digit. A delicate raised line is seen on the dorsum of the prebrachium. The prebrachium ends at the distal third of the forearm. The distance from the end of the fifth metacarpal bone and the olecranon (the manus being closed) equals one-seventh of the length of the forearm. (In *A. fuscus* this distance equals one-ninth the length of forearm.) The fourth and fifth metacarpal bones lie well palmed of the third. (In *A. fuscus* they are on the same line.) In repose the first phalanx of the third digit is nearly in the same line with the third metacarpal bone, as in *Noctilio* and *Miniopteris.* The second phalanx of the same digit is straight.

In a specimen from Beaverton, Oregon, sent me for examination by Mr. G. S. Miller, jr., Cambridge, Mass., the tip of the calcaral spur is distinctly lobed and the foot is exactly one-fifth the length of the forearm. The membranes and hair are black.

Variations.—Variation is slight in coloration, notwithstanding the extended range of the species and the great numbers found in certain localities. Leconte describes "entirely black" examples; these I have never seen. Occasionally the dorsum, where the hair of the side of the body ends and that on the membrane begins, is marked by a conspicuous line of hair having long white tips. The basal black or brown does not always abruptly end in the tip, but an obscure, rusty-black shade intervenes. I have not met with any varieties with furred thumb. The shafts of the hair in front may be plumbeous instead of brown black. The edges of the lips, as well as the internal basal lobe, are sometimes white. Very rarely the tip of the tragus is pointed instead of blunt. The external basal lobe may extend across the post-rictal wart to the mouth. The lobe is very rarely revolute in any degree.

A specimen from Healdsburg, Cal. (Cal. Acad. of Science), appeared to be somewhat darker, both in fur and membrane, but in essential particulars it was similar to Eastern forms.

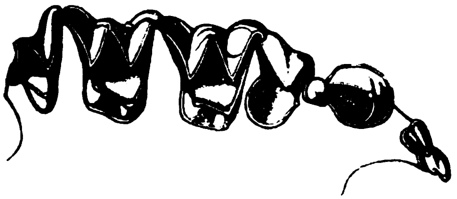
Skull.—There is no trace of a crest at the sagitta; temporal ridges are absent; the mesencephalon equals one-fourth the greatest length of the cranium; the eminence for the proencephalon minute and bears two foramina which are near each other; the vertex of the face with a low nasal eminence for the anterior one-third of the entire region; the posterior two-thirds is concave; the maxillæ are deeply concave on either side of the nasal eminence.

The fronto-maxillary region is produced laterally into a trenchant ridge which causes the inner wall of the orbit to appear concave. The infraorbital foramen is small and near the orbit. In the orbit the corresponding foramen is large and without concavity about it. A line produced from the upper margin of the anterior nasal aperture intersects the dental arch directly back of the canine tooth. The upper border of the zygomatic arch elevated. The paroccipital process is produced, but does not reach the level of the lower border of the occipital condyle; it is longer than the mastoid. The region between it and the mastoid is slightly inflated with a shallow incision inferiorly; it equals one-ninth of the greatest length of the skull. The tympanic bone is not complete above, the head of the malleus, as in *A. fuscus*, appearing in the interval and without an anterior basal process.

A small post maxillary process is present. Basioccipital without lateral concave depression. The sphenoidal tongue is conspicuous, concealing the cochlea at the anterior half. The posterior palatal spine is well developed; the vomer is recedant. The height of coronoid process above level of the condyle is less than the width of the horizontal ramus. The interval between angle and condyle is rectangular. The symphysis yields a small posterior process which ends opposite the second premolar.

Examination of the interior of the nose shows that the septoturbinal space extends a little in advance of the septal line. There is but a single opening for the ectoturbinal. The main plate is marked by a relatively small opening, behind which extends a row of three small foramina. On the nasal surface the endoturbinal series is inflated, and does not exhibit the lateral concavity seen in other Vespertilionidæ. It is directed downward and forward. The first endoturbinal is as in *A. fuscus*. It reaches a point as far as the canine tooth, is slightly depressed above, and presents a uniformly sloping surface laterally. Its lower edge forms the lower border of the median surface. The second endoturbinal is of uniform width, longer than high, and equal in length to the free portion of the first endoturbinal. The third endoturbinal is smaller than the preceding.

Maxillary teeth.—The median of the maxillary incisors is bifid on the cutting edge, and so placed as to be obliquely lodged in the jaw, the inner of the bifid points being directed outward. The lateral incisor with a conical outer (labial) surface and a trenchant flange of nearly the same length as the median aspect of the palatal surface. These two parts are in exact antero-posterior position to each other, thus being in contrast with the oblique position of the parts in the case of the central tooth. The canine is concave on the palatal surface, the trenchant border being in the line of the tooth axis; the labial surface posteriorly is concave. The first premolar is very small, but edged in the space between the outer and inner angles of the interval between the canine and second premolar; the second premolar scarcely longer than first molar with a sharp spine-like protocone and low rounded heel; the first and second molars with posterior commissure of the protocone



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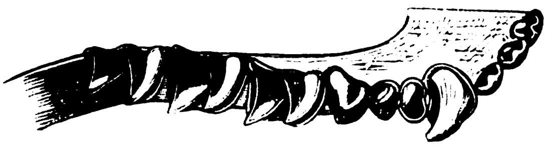

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1. MAXILLARY TEETH OF LASIONYCTERIS NOCTIVAGANS. X 8.
2. MANDIBULAR TEETH OF SAME. X 8.

absent; the anterior V nearly of the same size as the second; the heel is rudimental, the apex is seen as on the posterior part of the cusp of the heel in fig. In the third molar the posterior commissure of the protocone is entire and adjuts against the palatal end of the anterior limb of the second V, the second limb being absent.

Mandibular teeth.—The first incisor presents a trifid cutting edge and is more inclined than the others from within outward, thus permitting much of the base to be seen when the tooth is viewed from above. The second and third teeth gradually increase in thickness, the last named having a distinct nodosity back of, but on the same level with, the trifid cutting edge. The canine is concave on its posterior border, and presents an unusually broad cingulum. Of the three premolars the first is slightly larger than the second, the third is largest of the series, and is trihedral. All are surrounded by complete cingula. The molars are quite as in *Vespertilio* distinguished by possessing high acute tips.* A minute cusp out lines the posterior border of each molar at the lingual base of the heel. In the first and second tooth the heel is larger than the V, and projects farther on the buccal side and is without a trace of a commissure. The third molar differs from the same tooth in any of the genera of the group in the triangular form of the heel, but is a little smaller than the corresponding part in the first and second molar. It also is without a commissure.

Notes on the skeleton.—Coracoid process of scapula, with base broader than the apex, which is obscurely bifid. The inferior border of the innominate bone at the ischium and pubis produced. The thyroid foramen is subrotund. Ribs, eleven in number. Ulna as in *A. fuscus.* Palatal rugæ, seven.

Remarks on sex.—No secondary sexual characters have been detected. Females are much more numerous than males in the Adirondacks. (Merriam, *l. c.*) Out of eighty-five caught in one locality, but one was a male. In collections the males are less commonly seen than the females. I have examined ten males and fifteen females. The penis is whitish, long, subcylindroid—prepuce not expanded.

Habitat.—Distributed throughout the United States. It would appear from specimens in museums to be much less common toward the Western range than in the East. At the date of the publication of the monograph it had not been found in the Rocky Mountains or in California. According to J. B. Tyrrell (Mam. of Canada, 1888), *L. noctivagans* is found as far north as Hudson Bay.

Habits.—C. Hart Merriam (*l. c.*) has given close attention to the habits of the silvery bat. In his work on the Mammals of the Adirondack Region, this writer states that *L. noctivagans* is the most common bat in that section. In one locality, out of seventy species secured sixty-three were of this species. It is the earliest species to appear, and is especially fond of water ways and the borders of hard-wood groves. The young were found to be more "beautiful" than the adults and alone to possess perfect silvery tips to the hairs. This fact is not borne out by my examinations. I have found less difference in the color of the young and adult than in other species, and between the half-grown and the adult forms I have observed none of the contrasts which are so noteworthy in *A. fuscus*.

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* These are often worn off in the first and second molars in old individuals.

Mr. Merriam states that this bat has been known after being wounded and falling into the water to swim powerfully and swiftly against a strong current to the shore. This is an interesting fact. Mere fluttering of the wings of a wounded animal could not so direct the animal. It must be that a coördinated act (presumably in imitation of the act of flight) propelled the animal through the water.

Measurements.

	U.S.N.M.* 5291. St. Louis, Mo.	Collection of G. S. Miller, 1000. Beaverton, Oregon.
Head and body (from crown of head to base of tail)	37	38
Length of arm	23½	22
Length of forearm	38	36½
First digit:		
Length of first metacarpal bone	1½-2	2
Length of phalanges	5	5½
Second digit:		
Length of second matacarpal bone	32	35
Length of first phalanx	3	4
Third digit:		
Length of third metacarpal bone	33	35
Length of first phalanx	13	14
Length of second phalanx	6	10½
Fourth digit:		
Length of fourth metacarpal bone	34	35
Length of first phalanx	12	14
Length of second phalanx	6	7
Fifth digit:		
Length of fifth metacarpal bone	31½	33
Length of first phalanx	7	10
Length of second phalanx	4	5
Length of head	17	....
Height of ear	9	10
Height of tragus	....	....
Length of thigh	12	12
Length of tibia	14	12
Length of foot	7	7
Length of tail†	31	32

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*Not quite mature.

†The differences in some of the measurements of the two examples is due to the immaturity of specimen No. 5291.

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Ex-panse.	Nature of specimen.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	
3328	2.6	1.6	1.7	0.6	2.9	0.3	0.6	0.2	12.0	Dry.
4729	2.9	1.5	1.6	0.6	2.9	0.3	0.6	0.2½	12.0	Do.
746	2.5	....	1.7	0.6	2.9	0.3	0.6	0.2½	....	Do.
74	2.3	1.5	1.6	0.6	2.9	0.3	0.6½	0.3	....	Do.
2231	....	....	....	....	....	....	...			
	2.0	....	....	0.6	....	0.2				
1785	2.2	1.2	1.6	0.7	2.7					

List of specimens.

Cat. No.	Number of specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5331	1	James Bay, H. B	C. Drexel	Alcoholic	U. S. Nat. Mus.
5395	2	Moose Factory, H. B	......do	....do	Do.
5361	1	Middleboro, Mass	J. W. P. Jenks	....do	Do.
5427	1	Carlisle, Pa	S. F. Baird	Dry	Do.
5366	1	......do	David Miller	Alcoholic	Do.
5357	1	West Philadelphia	W. S. Wood	....do	Do,
5390	1	Mt. Holly, N. J	Dr. Geo. C. Brown	....do	Do.
5396	1	Washington, D. C	W. Wilson	....do	Do.
5328	1	Illinois River	R. Kennicott	....do	Do.
5391	1	St. Louis, Mo	Dr. Engelmann	....do	Do.
5393	2	Nebraska	Dr. J. G. Cooper	....do	Do.
5394	1	Platte River	W. S. Wood	....do	Do.
5431	2	Fort Union, Nebr	Dr. F. V. Hayden	....do	Do.
5350	1	......do	......do	....do	Do.
5316	2	......do	......do	....do	Do.
5429	1	Yellowstone River	Col. Vaughan	....do	Do.
[illegible]	1	Puget Sound	Dr. Kennedy	....do	Do.
5331	1	Fort Reading, Cal	Dr. T. F. Hammond	....do	Do.
5392	1	United States	(?)	....do	Do.
[illegible]	1	......do	Maj. Leconte	....do	Do.

Genus ADELONYCTERIS H. Allen.

Scotophilus Leach, Trans. Linn. Soc. London, XIII, 1822, 71. (*Type*, S. kuhlii.)
Vesperus * Keyserling & Blasius, Wiegm. Arch. 1839, Wirbelthiere Europas, 1840, 49.
Adelonycteris H. Allen, Proc. Acad. Nat. Sci. Phila., 1892.

Diagnosis.—As in the case of *Vespertilio* it is impossible to frame a diagnosis of a genus where the forms are cosmopolitan and the student is confined to material representing a fauna. I am content to designate *Adelonycteris* by the dental formula.

Dental formula.—Molars $\frac{3}{3}$, premolars $\frac{1}{2}$, canines $\frac{1}{1}$, incisors $\frac{2}{3} \times 2 =$ 32 teeth.

Vesperus was established on *Vespertilio serotinus* and *Vespertilio discolor*. It is distinguished from othe vespertilionine bats by the presence of a single molar in the upper jaw. The genus *Scotophilus* was based by Leach on an individual without locality. For many years English writers (especially Gray and Tomes) applied this name to the forms now included under *Vesperus* and *Vesperugo*. I followed the same practice in the Monograph of 1864, since I naturally assumed that these writers were acquainted with Leach's type. Peters in 1866 pointed out the fact that *Scotophilus* was distinct and embraced a group of bats none of whose representatives are found either in Europe or America. *Scotophilus*, therefore, can be no longer applied to any of our species. I have lately ascertained, through specimens in the possession of the Museum of Comparative Zoölogy, that *Scotophilus* closely resembles *Atalapha*, which genus it may be said to represent in Africa, Asia, and Australia.

Mr. F. W. True has called my attention to the fact that the *Vesperus* of Keyserling and Blasius, 1840, is antedated by *Vesperus* of Dejean, 1821. The latter was a *nomen nudum* until 1829, when it was taken up by Latreille and described. The *Vesperus* of K. & B. is, therefore, untenable. *Vesperus* is valid only in Latreille, 1829 (Coleoptera, Cerambycidæ). Acting upon the information herein conveyed, I have proposed (*l. c.*) to change the name of *Vesperus* as applied to a genus of Chiroptera to *Adelonycteris*.

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* K. & B. proposed *Vesperus* as a subgenus to *Vespertilio*.

1. Adelonycteris fuscus (Palisot de Beauvois), The Brown Bat. (Plates XV, XVI, XVII.)

Vespertilio fuscus Palisot de Beauv., Cat. Peale's Mus., 1796, 14; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 437.

Vespertilio carolinensis Temminck, Monog. Mam., II, 1835, 237; Harlan, Fauna Amer., 1825, 9; Godman, Amer. Nat. Hist., 1826, 67; Leconte, Cuv. An. King., (McMurtrie's ed) I, 1831, 431; Harlan, Month. Amer. Jour. Geol. and Nat. Sci., I, 1831, 218; *Ib.*, Med. and Phys. Researches, 1831, 28; Cooper, Ann. Lyc. Nat. Hist., N. Y., IV, 1837, 60; DeKay, Nat. Hist. N. Y., Zool., 1842, 10, Pl. II, f. 1.; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 434; Wagner, Schreb. Säugeth., Suppl., V, 1855, 753.

Vespertilio arcuatus Say, Long's Exped. Rocky Mts., 1823, 167.

Vespertilio phaiops Raf. Amer. Month. Mag., 1818, 445 (*not* Temm. Monog. Mam., II, 1835, 234); Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 437; Wagner, Schreb. Säugeth., Suppl., V, 1855, 756.

Vespertilio ursinus Temminck. Monog. Mam., II, 1835 ,234; Wagner, Schreb. Säugeth., V. 1855, 756; Max. zu Wied, Archiv Naturg., 1861, 190.

Vespertilio gryphus Wagner, Schreb. Säugeth., V, 1855, 749.

Vespertilio caroli Leconte (*not* Temm.), Proc. Acad. Nat. Sci. Phila., 1855, 437.

Scotophilus greeni Gray, Cat. Mam. Brit. Mus., 1842.*

Scotophilus fuscus H. Allen, Monog. N. A. Bats, 1864, 31; J. A. Allen, Bull. Mus. Comp. Zoöl., 1869, 208.

Vesperus serotinus var. *fuscus*, Dobson, Cat. Chirop. Brit. Mus., 1878, 193.

Vesperus serotinus Alston., Biolog. Centrali-Amer., Mam., 1879–82, 20.

Vesperus serotinus fuscus Merriam, Mammals of Adirondack Region, 1886, 184.

Diagnosis.—Scallops of auricle disposed to be revolute. Chin plate obscurely defined or triangular. Upper lip not defined—continuous with muzzle. Tragus blunt—outer border slightly convex. The median incisor bifid greatly larger than lateral coracoid. The process with small anterior spine from free end; not deflected posteriorly, but descends parallel to glenoid cavity. Dorsum of face naked; lips not whiskered.

Description.—Ears erect, but incline outward; the tip can be made to reach a point half way between the angle of the mouth and the snout. The general slope of the ear is elliptical, with the blunt tip turned slightly backward. The internal basal lobe broad rounded, but does not project back of the internal ridge; the anterior border of the ear convex, posterior emarginate and joins the region of the external ridge abruptly by a moderate first scallop, which is sometimes revolute. The external basal lobe is longer than high involute, scarcely elevated posteriorly, slightly oblique to the border of the auricle and thicker on free border than elsewhere. The second scallop occupies a triangular space and

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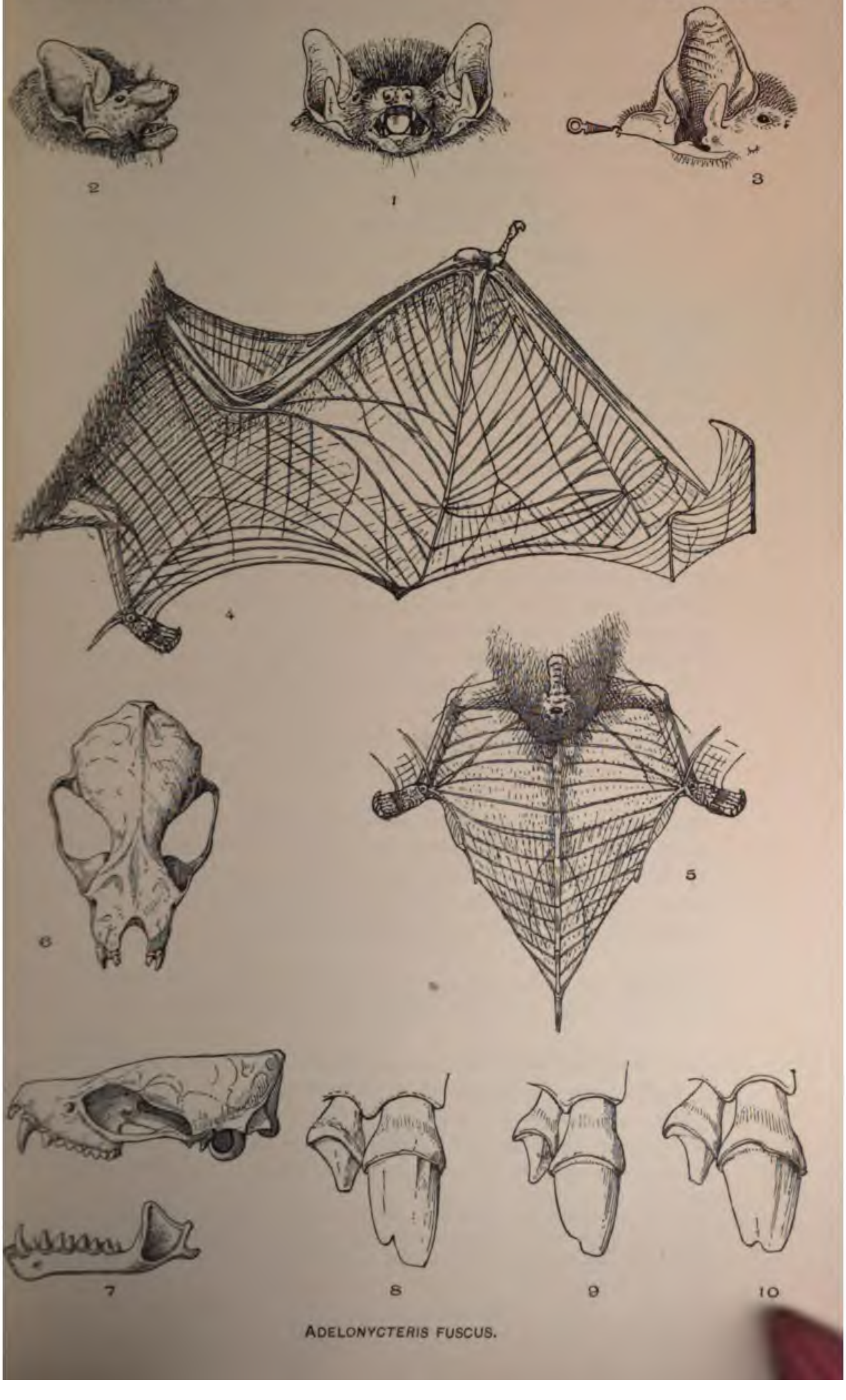
*J. A. Allen believes that *Eptesicus melanops* Raf., belongs to this synonymy. (See Appendix.)

EXPLANATION OF PLATE XV.

FIG. 1. Front view of head of *Adelonycteris fuscus*.
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner side of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIGS. 8-10. Maxillary incisors. x 16.



ADELONYCTERIS FUSCUS.

extends well upon the lobe. The tragus is straight or slightly concave on the inner border and convex on the outer; the tip is blunt. The external basal lobe is rounded, turned slightly forward; the notch above it is narrow but sharply defined. A conspicuous postrictal wart is present. The lips are fleshy and furnished above with a sparse row of coarse hair. Other than a few coarse hairs the face is naked. The snout is blunt, with scarcely any emargination between the palmate nostrils. The mental plate small, triangular, and obscurely defined. The postmental wart is commonly present.

The hair above is dark brown, or tawny, nearly black at the basal half with dark brown (olive) to lustrous isabella-brown tips. Below the colors are lighter, the general color being gray, pallid, or yellow brown. The tips of the hair on the surface last named varies greatly in tint among specimens of the same geographical range or locality. I have seen many fawn-colored individuals from the North Atlantic coast. In the neighborhood of Philadelphia specimens occur with fawn-colored tips, though the rule is for the color to be as above described. In the Western forms the tips may be obscure light buff.*

The hair extends on the membranes above from the proximal half of the humerus along the the side of the body to the proximal half of the femur. With the exception of a small portion of the prebrachium as it joins the neck the wing membranes are naked, as is also the space between the caudal vertebræ and the thigh. Beneath, the hair, as is the rule in Chiroptera, covers a large surface. A sparse growth reaches from the body to a point midway to or quite to the elbow, and, by a well-defined hem, from the middle of the humerus to the middle of the femur. The upper fourth of the interfemoral membrane is slightly furred.

In 11217, adult, from Brazos, Tex., the membranes are of a brown color, the basal parts of the hair on the dorsum are light brown, while the tips are of scarcely any different shade. In the venter the hair is likewise light brown at basal half, but the remaining portion of the hair is much paler. The ears and dentition are the same as in other of the species.

In 5335, adult, from Carson Valley, Nevada, the colors are much the same as in the example last named, except that the membranes are much darker.

In 12698, adult, from Santa Barbara, Cal., the external basal lobe, without incurved upper border hem, extends upwards nearly as far as the tip and completely concealing the external emargination; three conspicuous transverse lines on the inside of the auricle. The coloration is not distinct, being quite the same as in the average example.

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* "*A. fuscus* presents a wide range of apparently individual variation in color. Specimens from a single locality taken at the same season vary from a light-yellowish or golden tint to a deep sepia brown." (J. A. Allen, Bull. Am. Mus. Nat. Hist., III, [illegible], 189[illegible].)

But it may be said that the Californian specimens do not, as a rule, differ from the Eastern ones. I have many examples in good condition from Mr. H. A. Ward's collection, and find them in no way atypical.

The immature examples are often more white at the tips than are the adults, and in one specimen from Williamstown, Mass. (U. S. N. M. No. 4844), is almost an albino. Other things remaining the same, the presence of the long, whitish tips to the hair prepare the student for the fact that the specimen is not fully grown. The varying degrees in which the pale shades of the tips of the hair are met in adults depend upon the extent to which the colors of the young animal are retained.

Although pertaining to forms beyond the limits prescribed in this essay, the following notes may be of interest. Mr. J. A. Allen (Bull. Am. Mus. Nat. Hist. III, No. 169, 1890), describes a specimen from Nassau, which is one-third the size of the *A. fuscus* of the United States, and has delicate membranes and ears and is similar in color. In No. 8185 U. S. N. M., from Cuba, the colors are of an almost golden brown above the basal darker colors. In all other respects the specimen is like those from which the general description is drawn up. In No. 13215, adult, from Mirador, Mexico, the shades of basal brown on the dorsum are of a very dark brown, while the tips are warm sienna. On the venter of chest and abdomen the hair is of four obscurely differentiated shades of dark brown and gray, the tips being gray. The hair on the neck is of two shades only, the basal two-thirds being light brown, and the tips being conspicuously white gray.

On fresh specimens collected in Philadelphia a sparse growth of hair was found on the ventral surface of the endopatagium, extending along the arm and forearm to near the wrist.

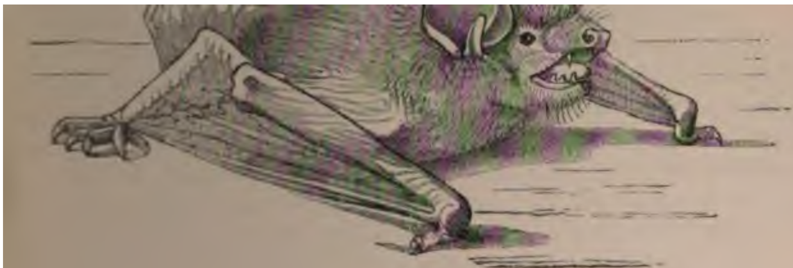
Membranes.—A small, oblique band is found at the muscle mass near proximal end of the fifth metacarpal bone on the mesopatagium, and one on the fourth interspace. The intercostal lines five in number. The postdigital line, as a rule, appears as one of two terminal branches, which arise from a common trunk in the angle formed by the approximation of the fourth and fifth metacarpal bones. The line may, in some instances, approach the fourth metacarpal and in some the fifth, when the arrangement resembles that of *Vesperugo carolinensis.* The predigital nerve shows the line from the muscle mass scarcely elevated. The terminal phalanx of the third finger slender, and equals two-thirds the length of the second. That of the fourth digit is L-shape.

The fifth phalanx is minute, a conspicuous accessory cartilage lies somad to it and projects slightly beyond the free margin of the endopatagium. A rounded callosity is seen at the ball of the thumb and palmar aspect of ankle. The tibial line does not reach the free margin of the endopatagium as it does in *Vespertilio.*

In the young and depilated adults a raised skin fold lies on the of the neck in line with the prebrachium. It is defined pollical muscle. The occipito-pollical receives

EXPLANATION OF PLATE XVI.

FIGS. 1, 2. *Adelonycteris fuscus,* showing the manner of resting. The forelimb touches the plane of support by the callosities at the base of the thumbs. The phalanges of the wing are flexed forward. The tail is arched and the tip touches the ground.



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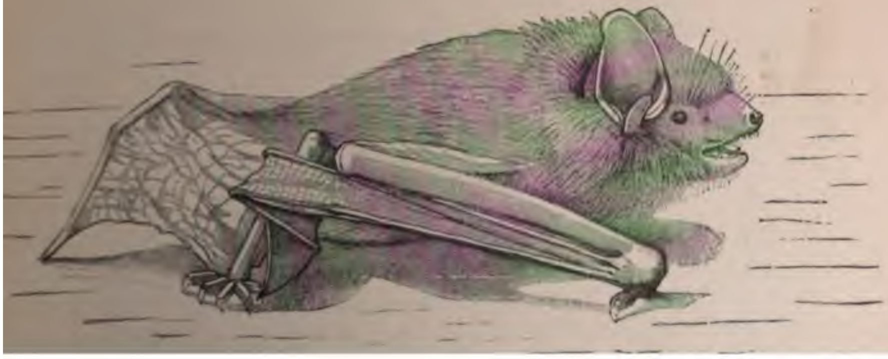


pectoralis. The first three joints of the tail are displayed ventard; the remaining joints are displayed dorsad. The third metacarpal, with membrane palmad concealing contour at the proximal third. The fourth metacarpal is crossed obliquely by several nerves from the third to the fourth interspaces.

Variations.—The second scallop of the auricle may extend up a little beyond the external basal ridge along the outer border, or it may be divided into two parts by a notch at the ridge, and that portion of the hem above the notch be revolute backward and reach the curve of the tip, thus obliterating the emargination. This was well seen in an old individual in the National Museum, collected by Mr. Henshaw in the Northwest territory. The external basal lobe may not have an involute border. The tragus may be scarcely at all convex on the outer border and nearly the same width throughout. The margin of the interfemoral membrane joins the tail at the joint between the terminal and the adjoining vertebra instead of half along the last segment which is the rule. The lobe at the end of the calcar is often absent, while the post-calcaral lobe itself is rarely so. The tip of the tail in one immature specimen from Panama (3214 Cam.) was not exsert.

For variations in lengths of the metacarpal bones, see measurements.

The following notes have been taken from a number of examples collected in California. The tragus is coarsely crenulate on the outer border. The first scallop is markedly convex. The second scallop is wide and conceals the posterior third of the external basal lobe, but does not extend far up on the first scallop. The fleshy tip to the tail occupies the greater part of the exsert portion. The face, ear, and membranes are black.

In three specimens the manal formula is subject to variations. It is as follows:

	mm.	mm.	mm.
Second interspace	2	1½	2
Third interspace	8½	11	13
Fourth interspace	31	35	30
Forearm	44	42	44

Skull.—The sagittal temporal crest is well developed over the mesencephalon; of equal height with the occipital crest, the two forming a conspicuous elevation at the back of the skull. The region of the mesencephalon equals three and one-half times the length of the skull. The region of the proencephalon is flat and retains one foramen. The vertex of the face with a low nasal eminence for the anterior half. The posterior half is depressed, and is continuous with the anterior two-thirds of the sagitta. A shallow fossa is seen on the maxilla at the side of the nasal eminence. The fronto-maxillary region is moderately inflated. A distinct projecting lamina overlies the lachrymal bone. The inner wall of the orbit is nearly flat, while its upper border is inflated. The infra-orbital foramen is large, subcordate, and defined inferiorly. The depression in the region of the foramen extends beyond the region of the roots of the third premolar in a manner much the same as in *V. hesperus*. A distinct lachrymal canal in the orbit is seen, but no concavity lies above it. The line produced downward from the upper border of the anterior nasal aperture intersects the dental arch directly back of the canine tooth. The paroccipital process almost reaches the level of the lower border of the occipital condyle. The region between the paroccipital process and the mastoid is not elevated; it retains a deep incision inferiorly, and equals one-seventh of the greatest length of the skull.

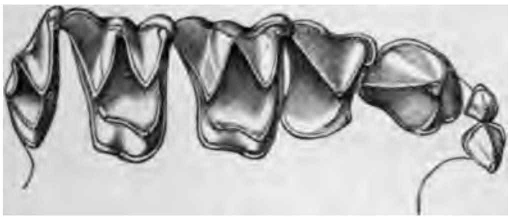
The space between the swelling over the roots of the upper incisors and canine is without groove. (See *A. serotinus*.) The upper border of the anterior nasal aperture is rounded. (See *A. serotinus*.)

There is no post-maxillary process. The tympanic bone with a small anteriorly produced process on the base. The anterior palatal notch reaches to a line intersecting the middle of the canine tooth. The height of the coronoid process above the level of the condyle greater than the width of the horizontal ramus. The interval between the angle and the condyle is semicircular. The impression for the masseter muscle is deep, and sharply defined inferiorly. Angle on line with the outer third of condyle, and is therefore scarcely deflected.

Inner ear.—Superior semicircular canal, free; the external, scarcely free; a small opening is seen in the bone almost occupying loop. A small portion of the cochlea is exposed on the side of the skull, just below the union of the occipital with the squamosal.

The openings of the septoturbinal space are confined to a large foramen, placed just in advance of the nonperforate space. Near to the septum, at the anterior portion of the space, is seen a group of foramina advancing well to the front. Directly opposite the beginning of this series, to the lateral side, is the group of foramina for the first endoturbinal plate, while in front of the latter lie two foramina for the single ectoturbinal plate. The arrangement is the same in *Vesperugo*. The ectoturbinal is as in *Noctulinia noctula*, with the exception that it is deflected a little more outward. The first endoturbinal is acuminate, with a uniformly sloping border. On the medium service the plate is not visible below the second and third plates. The second plate is as in *N. noctula*. The third is longer than wide.

Maxillary teeth.—The maxillary central incisor long, chisel-shaped, slightly inclined medianly in young and young adults, but to a less degree than in *A. serotinus*; bifid on the cutting edge, the outer nodule being larger. The cingulum narrow, uniform, entire. The lateral incisor rudimental, conical, cingulum broad, uniform, entire. The incisors exhibit considerable variation. Some of these are exhibited in accompanying figures. (Pl. XV figs. 8–10.) The modifications consist in proportion of cingulum to length of crown in the size of the small cusp on th cutting surface of the central tooth, and in the size and degree of con ity on the outer border of the lateral tooth. In one



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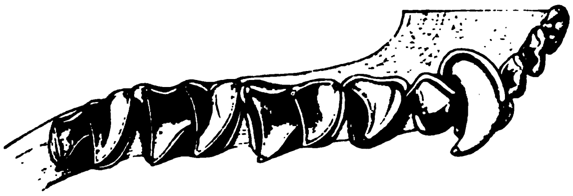

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1. MAXILLARY TEETH OF ADELONYCTERIS FUSCUS. X 8.
2. MANDIBULAR TEETH OF SAME. X 8.

without locality) the central incisor was not bifid. Canine with a narrow posterior concave service; it is deflected a little outward so as to permit the flange between it and the palatal surface to lie in the axis of the tooth row. The palatal surface remarkable for a narrow column-like longitudinal ridge at the flange defining the surface anteriorly. The single premolar not distinctive; it lies in contact with the canine; in this regard it differs from the arrangement in *A. velatus*, where an interval is defined. The first molar with the first V-shaped figure is much smaller than the second; the protocone exhibits an occasional crenulated appearance posteriorly. In the second molar the V's are equal. In the third molar the protocone is simple entire, the heel absent; in this tooth the posterior limb of the first V equals one-half the length of the anterior, while the second V is represented only by the initial half of the anterior limb.

Mandibular teeth.—Incisors equal, crowded, all possessing trifid cutting edges, the third being slightly thickened, and in some individuals the trifid figure obscure. Canine with deep, broad, concave posterior surface, small lingual surface—the two being separated by a laminate flange; a prominent posterior cusp lies on the lingual side. The first premolar is smaller than the second, and is wedged in by the basal cusps of the canine and the premolar. The molars quite as in *Vespertilio*, *i. e.*, with sharply acute cusps, especially prominent hypoconid, and small cuspule in posterior borders.

Notes on the skeleton.—The coracoid process of scapula, with a small anterior spine from the free end—none from the posterior. The external tuberosity of humerus slightly higher than the internal trochlear spine; small nodular, and looks directly backward. The oblique keel on articular surface wider than the grooves. The outer groove is much the narrower and confined to anterior and axial parts, *i. e.*, is absent posteriorly. The articular surface one-third wider internally than externally. The proximal rudiment of ulna not anchylosed to the radius. The slender thread-like shaft lies against the radius at its middle, but not joined to it. It ends in fibrous tissue, and is gradually lost near the wrist. The distal ulna rudiment is quadrate and perforate. Number of ribs, eleven.

Habits and distribution.—The brown bat is probably the most common species of any in the United States. The red bat and the little brown bat appear to be numerous in collections, and are more likely to be gathered in large numbers in some localities than is the brown bat. But on the whole the brown bat is the one most generally met with. It frequents not only the open country but the towns. It often enters our apartments at night in search of a resting place, and not for food, as is often surmised. According to C. Hart Merriam (Mammals of the Adirondack Region, 1886) it is rare in the mountainous tracts of northern New York, and it is believed that the species may be, in the main, a dweller in the warmer low ranges. The highest latitude named for it in the Monograph of 1864 was Lake Winnipeg, British America. J. J. Allen reports it from British Columbia. According to J. B. Tyrrell (Mammals of Canada, Toronto, 1888), *A. fuscus* has been collected in Ottawa City and Lake Winnipeg. Mexican and Antillean forms when compared with the more northern examples are found to be of the same species. It has been secured from all parts of the United States, but I am unable to give any rate of its distribution.

C. F. Maynard (Mammals of Florida, *l. c.*) found it frequently in the northern sections of Florida, but more abundantly in the vicinity of settlements than elsewhere. "I once captured," he states, "a female of this species which was heavy with young. I placed her in a cage and left her. After an absence of an hour or so I returned and found that she had escaped, but had left a young one clinging to the woodwork on the side. The little thing was entirely naked, but was furnished with teeth, which it showed when handled, and endeavored to bite, squeaking after the manner of all these animals. I replaced it in a cage, where it remained until night, but in the morning it was gone, and I supposed that its mother had carried it away."

The brown bat when at rest is not often found hanging by its thumbs or feet. As a rule, it rests with folded wings flat upon a rough wall or inside of a hollow tree, with its head directed downward. The following note is taken from a study of the living animal in captivity:

The tail is arched beyond the second caudal vertebra: the fleshy tip is apparently tactile, and kept close to the plane on which the animal reposes. The toes are widely abducted (see Pl. XVI). When excited the little creature emits a rapid succession of short, high-pitched sounds, at the same time opening the mouth to an extraordinary extent, exposing fleshy masses in the position of the masseter and internal pterygoid muscles. The animal is hibernating. It appears to be simply drowsy; it can be easily aroused, and the heat of an apartment at about 65° F. restores it to activity. The breathing is entirely by the flank (so far as can be observed by sight and touch), after the manner of birds. As already mentioned, the hair of the back and loin is moderately appressed and of a different luster from that of the neck and head. The animal is not sensitive to moderate sounds, but loud noises startle it when not in deep torpor from cold. A puff of air blown upon it brings it up instantly from lethargy, causing it to contract its wings to the smallest compass and open its mouth in evident agitation. The ear when touched with a probe induces the external basal ridge to be curved inward (back of tragus) and lie against the internal lobe, while the deeper parts are completely closed; the tragus is erect and its axis oblique (outward and upward) to the axis of the auricle.

Fat is stored up in this species (probably likewise in others) in two large coarsely lobate masses between the scapulæ, in the recesses between them and the head, and about the pubis. In the latter locality it is oily and less compact than is seen elsewhere.

Note on *Adelonycteris serotinus*.—Dobson (*l. c.*) includes *A. fuscus* under *A. serotinus* Schreb. In his judgment it should constitute but a variety of the Old World species. "It differs," says this observer, "from European forms of *V. serotinus* and from those from Central America in being smaller, the forearm apparently never exceeding 1″.8 and the foot 0″.4: also in the somewhat deeper emargination in the upper half of the outer margin of the ear." He follows these remarks with a table of measurements of specimens from North America and Cuba. C. Hart Merriam (Mammals of the Adirondack Region, 1886), follows Dobson and designates *A. fuscus*, under the rules of the Nuttall Ornithological Club, as a geographical variety, viz, the *V. serotinus fuscus*. I have examined two adults and three immature specimens of *A. serotinus* (National Museum) in the preparation of this revision, and hold to the opinion expressed in the Monograph of 1864, that it is distinct from *A. fuscus*.

In this connection the following description of *A. serotinus* is presented:

Hair everywhere, both on dorsum and venter, nearly unicolored; the base and greater part of the shaft is of a dull brown, the tips slightly lighter. The light shade is more marked on the venter than on the dorsum. The young are much lighter, and present a distinctly pallid appearance everywhere. The color of the tips of the hair of the dorsum is lighter than that of the shafts.

The hair on the membranes in both adult and young as in *A. fuscus*, except that a sparse growth of pallid hair extends on dorsum of the interfemoral membrane between the tail vertebræ and the thigh. This space is naked in *A. fuscus*.

Skull.—The lachrymal swelling on the orbit is convex; seen from above it is much more prominent than in *A. fuscus*, while the process over the lachrymal is much less trenchant. The sagittal crest at the occiput is stouter. A conspicuous groove lies on maxilla between the swelling over the roots of the canines and incisors.

Teeth.—The lateral maxillary incisor is convex on outer border instead of being concave. I have seen but one exception to this in *A. serotinus*; in *A. fuscus* it is the rule. The median maxillary incisors are sharply inclined toward each other. The anterior nasal aperture is acuminate above. The lower incisors are more crowded than in *A. fuscus*; the outer tooth is in contact with the canine by a broad surface. The hypocone of the last molar is quadrate.

In *A. fuscus* the palatal rugæ are seven in number. The first lies directly back of the incisors and is entire. The second and third are simple, and as a rule lie straight across the palate and are arranged in double crescents at irregular intervals, *i. e.*, the spaces between them are equal. In *A. serotinus* the palatal rugæ are also seven in number. The first is interrupted in the center. The second is sinuate instead of straight as in *A. fuscus*. The remaining are arranged in crescents at equal distances apart. In a half-grown example the rugæ are throughout arranged in crescents. I place but little reliance, however, upon the characters derived from the rugæ.

Measurements.

[U. S. N. M., 11217. ♀. Brazos, Tex.]

	Millimeters.
Head and body (from crown of head to base of tail)	52
Length of arm	29
Length of forearm	47
First digit:	
Length of first metacarpal bone	4
Length of phalanges	5
Second digit:	
Length of second metacarpal bone	41
Length of first phalanx	4
Third digit:	
Length of third metacarpal bone	42
Length of first phalanx	16
Length of second phalanx	13
Fourth digit:	
Length of fourth metacarpal bone	41
Length of first phalanx	14
Length of second phalanx	9
Fifth digit:	
Length of fifth metacarpal bone	41½
Length of first phalanx	10
Length of second phalanx	6
Length of head	12
Height of ear	14
Height of tragus	7
Length of thigh	18
Length of tibia	18
Length of foot	9
Length of tail	46

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Ex-panse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
4731	2.6	1.4	1.9	0.9	2.9	0.3	0.5	0.2½	10.0	Dry.
4734	2.9	1.5	1.9	0.9	3.0	0.5	0.6	0.3	11.0	Do.
4737	2.5	1.5	1.8	0.8	3.0	0.4	0.5	0.2½	10.0	Do.
4739	2.9	1.4	1.8	0.9	3.0	0.4	0.7	0.3	10.0½	Do.
473	2.6	1.4	1.6	0.7	3.0	0.4	0.5	0.3	(?)	Do.
(?)	2.7	1.5	1.7	0.8	3.0	0.4	0.5	0.3	11.0	Do.
3137	2.2	1.6	1.9	0.7	3.0	0.4	0.5	0.3	9.6	Do.
537	2.4	1.4	1.6	0.7	2.6	0.3	0.5	0.2½	(?)	Do.
424	3.0	1.4	2.9	0.8	3.0	0.4	0.6	0.3	10	Do.

List of specimens.

Catalogue number.	Number of specimen.	Locality.	Presented by—	Nature of specimen.	Collection.
6192	1	Lake Winnipeg	R. Kennicott	Alcoholic	U.S. National Museum.
5306	2	Williamstown, Mass	S. H. Scudder	do	Do.
5302	1	Westport, N. Y	S. F. Baird	do	Do.
5304	1	Carlisle, Pa	do	do	Do.
5307	1	Washington, D. C	Col. Weaver	do	Do.
5284	1	do	T. R. Peale	do	Do.
5306	1	Cleveland, Ohio	Dr. Kirtland	do	Do.
5309	1	Mississippi	Col. Wailes	do	Do.
5310	1	Roane County, Tenn	Prof. Mitchell	do	Do.
5332	3	Grand Coteau, La	St. Charles College	do	Do.
5311	1	St. Louis, Mo	Dr. Geo. Engelmann	do	Do.
5324	1	Fort Riley, Kans	Henry Brandt	do	Do.
5328	7	Nebraska	Dr. J. G. Cooper	do	Do.
5315	1	Milk River, Nebr	Dr. Hayden	do	Do.
5317	2	Fort Pierre, Nebr	Dr. J. Evans	do	Do.
5309	1	Fort Towson, Ark	Dr. Edwards	do	Do.
5308	1	Fort Smith, Ark	Dr. Shumard	do	Do.
5271	1	Mouth of Poteau River	do	do	Do.
6191 var.	1	Brazos River, Texas	do	do	Do.
5330	1	Puget Sound, Washington	(?)	do	Do.
5325	1	Carson Valley, Nevada	Capt. J. H. Simpson	do	Do.
5326	1	San Francisco, Cal	H. B. Mollhausen	do	Do.
5514	1	Posa Creek, California	Dr. Heermann	do	Do.
4337	1	United States	Maj. Leconte	do	Do.
4731	1	do	do	do	Do.
4739	1	do	do	do	Do.
4734	1	do	do	do	Do.
5330	1	do	(?)	do	Do.
5344–5	2	do	(?)	do	Do.
5411	1	El Mirador, near Vera Cruz, Mexico.	Dr. C. Sartorius	do	Do.

Genus **VESPERUGO** Keyserling and Blasius.

Dental formula.—Molars $\frac{3}{3}$, premolars $\frac{2}{2}$, caninis $\frac{1}{1}$, incisors $\frac{2}{3}\times 2=34$ teeth.

The subgenus *Vesperugo* was established in 1839, by Keyserling and Blasius (Wiegmann's Archiv, 1839, 312; Wirbelthiere Europe as 1840). It is characterized by the possession of two premolars in both the upper and the lower jaw.* It resembles *Adelonycteris* in the naked face and absence of whiskered lips.

For remarks on the separation of this genus from *Scotophilus*, see *Adelonycteris*.

1. **Vesperugo carolinensis** (Geoff). The Carolina Bat. (Plates XVIII, XIX.)

Vespertilio carolinensis Geoff. Annal. du Mus., Paris, 1806, VIII, p. 193; Desmarest, Mammalogie, 1820, 136 (*not* Temminck; see *Adelonycteris*).

Vespertilio georgianus Fr. Cuv., Annal. du Mus., Paris, 1832, 16; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 436; Wagner, Schreb. Säugeth., V, 1855, 750.

Vespertilio monticola Bachman, Proc. Acad. Nat. Sci. Phila., 1841, 92.

Vespertilio crassus (?), Fr. Cuv., Annal. du Mus., Paris, 1832, 17.

Vespertilio salarii (?), Fr. Cuv., Annal. du Mus., Paris, 1832, 17.

Scotophilus georgianus H. Allen, Monog. N. A. Bats, 1864, 35.

Vesperugo georgianus Dobson, Cat. Chirop. Brit. Mus., 1878, 235.

Vespertilio erythrodactylus (?), Temminck, Monog. Mam., 1835, II, 237.

In the opinion of Mr. J. A. Allen (Mam. of Massachusetts), *V. georgianus* of Fr. Cuvier is the same as *Vespertilio subulatus* (*V. gryphus*). The

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*I exclude *Noctulinia noctula* and *Vesperugo leisleri*. See Proc. U. S. Nat. Mus., 1893, 30.

acceptance of this conclusion would leave the species which is here described unnamed. Unfortunately no one can definitely tell what the *Vespertilio georgianus* really is, if we put aside the testimony of Major Leconte, who sent the original material to Fr. Cuvier for study (*Vide* Monograph of 1864, p. 37).

This species was named *Scotophilus georgianus* in the first edition of this Monograph. The assignment to *Scotophilus* has been explained on page 111. The specific name was derived from the paper of Maj. Leconte, in which it was claimed that while the number of the teeth was that characteristic of *Vespertilio*, the back was described in the following language: "Dark plumbeus above tipped with bright rufous, the hair so arranged that the pelage appears varied with black, particularly on the upper part of the back." No other bat than the one under discussion has fur so colored; so it is evident that some other species than a member of the genus *Vespertilio* was intended. The statement regarding the teeth was erroneous. I was favored with an opportunity of examining a collection of bats which had been named by Maj. Leconte, and the bat identified by me at the time of writing the monograph as *Scotophilus georgianus*, is undoubtedly the same as the one named *Vespertilio georgianus* by Maj. Leconte.

The following passage from the Monograph is apropos to the present statement:

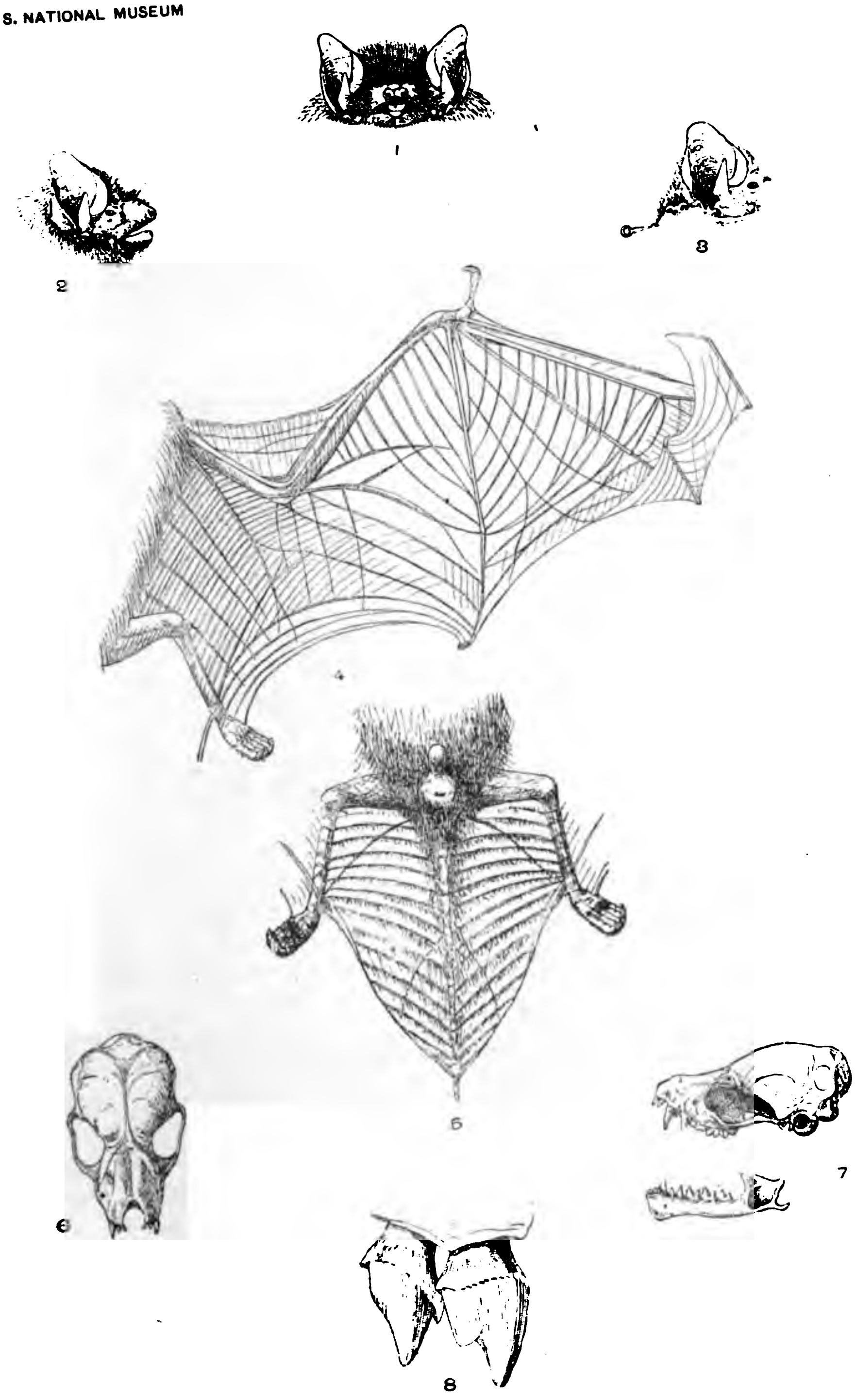
> This species has been but imperfectly described by the authors above cited. Fr. Cuvier's diagnosis is quite incomplete, and would be undistinguishable from that of the smaller form of *V. gryphus* had it not been that, from having sent the author the specimen from which the description was taken, Maj. Leconte was familiar with the type, and afterwards gave a more exact description of the animal in the work above cited. He, however, was himself in error in some particulars, especially in making the dentition similar to that of *V. subulatus* (*V. gryphus*), and in asserting that the last false molar of the upper jaw was bi-emarginated. I have before me a large series of specimens, some of which have Maj. Leconte's name attached, but in none of them have I found any internal basal bi-emarginate cusp as described by him
>
> Dr. Bachman's description of *V. monticola* applies well to *S. georgianus*, excepting in the measurements, which, in the case of the ear and tragus, are entirely too small in proportion to the size of the body. I have an alcoholic specimen, marked *V. monticola*, in the same handwriting as some other specimens purported to have been labeled by Dr. Bachman, which is beyond doubt *S. georgianus* (*V. georgianus*), the ear and tragus being of the usual size.

Vespertilio carolinensis Geoff. (Annales du Museum, 1806, VIII, fig., pl. 48) is figured as having *two* premolars in the upper jaw. Temminck (Mammalogie) gives five molars in each jaw. This fact would separate the species from *Vespertilio* and place it in *Vesperugo*. The figure of the head (Fig. 1, pl. 59) is quite compatible with that of *Vesperugo*. Geoffroy (*l. c.*) and Desmarest (Mammalogie, 1820, 136), however, both speak of its resemblance to *V. murinus*. The writer last named also speaks of its resembling *V. becksteinii*, Leisler, a species not known when Geoffroy framed his description.

Temminck, for some reason not given, claims that his *Vespertilio carolinensis* resembles *V. serotinus*, and thus indicates its relation to the

EXPLANATION OF PLATE XVIII.

FIG. 1. Front view of head of *Vesperugo carolinensis*.
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIG. 8. Maxillary incisors. x 28.



VESPERUGO CAROLINENSIS.

genus which in this essay will receive the name of *Adelonycteris*. But Temminck's figure does not harmonize with his statement; the arrangement of the digital nerves in the fourth interspace of the wing membrane being precisely that of *Vespertilio;* the lips are whiskered, the tragus erect and subulate as in the American species. Nevertheless Temminck was followed by Maj. Leconte, myself, and Dobson; and so it came about that *Vespertilio carolinensis* Geoff. up to the date of the present writing has been considered to be not a species of *Vespertilio* but one of the genus having less than three premolars in each jaw. It is evident that these statements are less substantiated by facts than are those of Geoffroy and Desmarest. Unfortunately the skull as figured by Geoffroy is that of a vesperugan species, while his description is of a vespertilionine species. Can we conclude that the correct figure is drawn, and that both Geoffroy and Desmarest were in error in claiming that a resemblance exists between *V. carolinensis* and a species of *Vespertilio?* I think the conclusion last drawn is the correct one, and I infer that a bat with two premolars in the upper jaw was known to Geoffroy inhabiting the United States near Charlestown, S. C. This being assumed I note that the tragus, while of the same shape and relative size as in *V. murinus*, is yet half heart shape (demi-cœur), which, while not accurate for a North American *Vesperugo*, is not directly misleading. The tips of the hair of the belly are certainly yellow, and *V. georgianus* of Leconte is the only one in which they are so. The face is also shorter and relatively broader than in *V. murinus*. So serious is the discrepancy between the description of *V. carolinensis* of Temminck and his figure that his account must be put aside.

I conclude that the *Vespertilio georgianus* of Maj. Leconte, *Scotophilus georgianus*, of my Monograph of 1864, and the *Vesperugo georgianus* of subsequent writers, must be considered synonyms of *Vespertilio carolinensis* Geoff.,and that the name *georgianus* Fr. Cuvier must be put aside and that of *carolinensis* substituted therefor.

Concerning *Vespertilio erythrodactylus* Temminck, it may be said that while one false molar only is stated to be in the upper jaw, the entire number of molars is given as five. The membranes are black, but the base of the fingers and the "interdigital membrane of the first finger" are red. The tragus is subulate (en feule de saule); the fur is light red brown above (base of tail well covered), lighter shades of the same predominating below. Length of head body, 1′.6‴ to 2‴; tail, 1′.4″; forearm, 1″.2‴; expanse, 7″.6‴ to 8. The specimens upon which the above description is based were collected in the neighborhood of Philadelphia. On the whole, *V. erythrodactylus*, other than in the red color of the base of the fingers and the length of the forearm, bears a close resemblanceto *Vesperugo carolinensis*. It is well to state that Maj. Leconte (*l. c.*) has failed to identify *V. erythrodactylus*.

Diagnosis.—Membranes of a dark brown color; hair chestnut brown mixed with paler shades; the thigh is hairy throughout; the ear is as long or slightly longer than the head; second interspace without pigment. Predigital line absent in fourth interspace, as a rule. The nerve may arise from angle as in *A. fuscus*. Very rarely on one side only is the arrangement as in *Vespertilio*. Transverse lines of the interfemoral membrane numerous, regular, furnished with minute dots which are hairy. Post-calcaral lobe absent. Foot one-fourth the length of the forearm. Tip of coracoid furnished with two coequal processes.

Description.—Ear oval with slightly convex anterior sinuate, or straight outer border and blunt tip. The internal basal lobe much longer than high, as in *Adelonycteris*. The external basal lobe begins at the pilose post-rictal wart as a low skin-fold. Gradually it becomes higher, and at the posterior half is a thickened nodule with an inclination to incurve on the concavity of the auricle. The second scallop (hem) is larger than the external basal lobe. The external basal ridge ends on the border of the ear in a thickened convex border (first scallop) which extends one-half the height of the ear. It is followed by a shallow emargination, above which underlies the blunt tip. The tragus is erect, with blunt tip and straight inner border. The outer border is wider just above the well-defined notch than elsewhere and is slightly convex. The basal lobe is rounded and diverted forward.

The face more hairy than in *A. fuscus* and less blunt at the snout, which is scarcely, if at all, concave on the outer border. (No. 6088 U. S. N. M.) The fur of the back dark brown, almost black at basal half, apical half abruptly contrasted to base as being pallid, dull yellow, or light chestnut, the last-named hue predominating, the extreme tip again darker sienna, though of lighter shade than the base. The fur of the venter the same as that of the back, but without dark tips. A harmony exists between the colors of the two sides; thus, when the back is dull yellow the venter is of the same color, and so for each of the shades; the hair on the membranes unicolored. In specimen No. 4979 S. I., Woburn, Mass., the dark tip to the fur, especially on the dorsum, was so long as to give a somber cast to the entire pelage. In new examples from Bee County, Tex. (Nos. 3482 and 3483, Am. Mus.), this characteristic was particularly well marked and suggested the style of coloration seen in *Atalapha*. The hair on the membrane on the dorsal aspect covered the proximal third of the arm, and extended thence on the membrane outward to a line answering to the knee; hence the membrane is curved for a greater distance than would be indicated by the extent to which the humerus is covered. The species is distinctive in the entire thigh being hairy. The interfemoral membrane is hairy at its basal half and of a uniform iron-rust hue. The haired surface includes the proximal half of the tibia.

On the ventral aspect the membranes are furred at the proximal third of the humerus, and thence as a sparse thin growth in the interval between the elbow and the knee. The interfemoral membrane is heavily furred below the pubis, and very sparcely so on the trans lines for nearly its entire extent. Specimen No. 5985 S. I., Carlisle, Pa., retains scarcely any basal or apical brown on the dorsum, the hair is of an obscure pallid hue, while beneath a rich chestnut color predominates.

A young specimen which measured 30^{mm} from crown of head to the pubis possessed short unicolored hair throughout. On the dorsum the hair was light rufus brown. On the venter the color was more obscure. The left side of the neck and body was old gold, while the right side was the color of the rest of the venter. The hair on the front of the neck was not smooth, but presented the appearance of a ruffle or irregular roussette. On the membranes the hair distribution was the same as in the adult, excepting that the dorsum of the interfemoral membrane was furred to a line above the ankles.

Variations.—The ear may be slightly longer than the head. Variations in the arrangement of the nerves of the fourth digital interspace are noted in the diagnosis.

The membranes.—*V. carolinensis* is remarkable for the absence of pigment from the second digital interspace. The wing membrane is attached to the foot at the base of the toes. The tip of the tail is exsert from an ample interfemoral membrane, whose free border is slightly convex. The calcar ends without marginal tip; there is no post calcaral lobe. The bodies of the caudal vertebræ are all dorsal; the upper part of the interfemoral membrane is not furnished with transverse muscle fibers.

Intercostals are three in number. Coraco-brachialis fascicle from the axilla. The fourth interspace with two long conspicuous predigitals, but, as a rule, no postdigital. The third interspace with the nerves from the metacarpo phalangeal joints. In a few specimens the two postdigitals arise from a common line which extends parallel to the fifth metacarpal bone, in which case a close resemblance to some forms of *Adelonycteris fuscus* is seen. The terminal phalanx of the fourth finger as in *L. noctivagans.*

The interfemoral membrane is marked by a number of delicate transverse, slightly pilose lines, which can be traced upward as far as the second caudal vertebra. The pilose spots are conspicuous on these lines, as well as on those of the endopatagium near the body. The terminal cartilage of the fourth digit is directed pollical.

Maxillary teeth.[*]—The central incisor bifid (rarely monocuspid); a thin lamina terminates the tooth posteriorly. The lateral is smaller, with a thin transverse lamina on either side of the single cusp. An interval between the lateral and the canine. The canine as in *A. fuscus*, *i.e.*, the posterior surface deflected outward beyond the axis of the den

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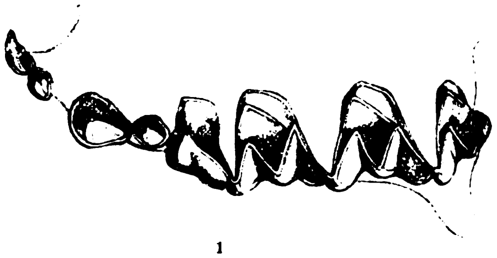
[*] Maj. Leconte (*l. c.*) notes the following: "Posterior false molar of the upper jaw has an interior basil, biemarginate cusp formed from a prolongation of the calcaneum of the tooth, and the canine of the lower jaw has an interior, blunt, basal lobe." I have not recognized the peculiarities here noted.



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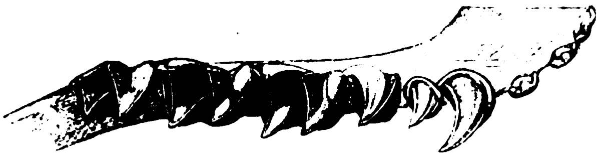


2

1. MAXILLARY TEETH OF VESPERUGO CAROLINENSIS. X 12.
2. MANDIBULAR TEETH OF SAME. X 12.

of ulna not anchylosed to radius. The long thread representing the shaft appears to join the radius at the distal third; it is more fixed than in *Vesperus*. The distal rudiment oblique proximal and concave outer border (perforate?). The ribs are eleven in number. The pectineal spine of the innominate bone small, little more than a nodule. The thyroid foramen elliptical. The tuberosity of the ischium not prolonged. The posterior border of the innominate bone oblique. The cavity of the pelvis narrowed from side to side. Fibula as long as the tibia.

Habitat.—The Austroriparian region, and extending thence to the north as far as Carlisle, Pa., and to the west to eastern Missouri. Nothing is known of its habits. It is often found in collections associated with *Vespertilio gryphus*, but it is not known to be collected in the same locality with this species.

Measurements.

[Mus. Comp. Zool. 5992 ♀, Short Cave, Ky.]

	Millimeters.
Head and body (from crown of head to base of tail)	26
Length of arm	21
Length of forearm	31
First digit:	
Length of first metacarpal bone	2
Length of phalanges	6
Second digit:	
Length of second metacarpal bone	29½
Length of first phalanx	2½
Third digit:	
Length of third metacarpal bone	30
Length of first phalanx	12
Length of second phalanx	11
Fourth digit:	
Length of fourth metacarpal bone	21
Length of first phalanx	11
Length of second phalanx	6½
Fifth digit:	
Length of fifth metacarpal bone	29
Length of first phalanx	8
Length of second phalanx	4
Length of head	14
Height of ear	10
Height of tragus	4½
Length of thigh	13½
Length of tibia	14
Length of foot	6
Length of tail	22

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5298	1.8	1.6	1.4	0.6	2.4	0.4	0.5	0.3	9.0	Alcoholic.
5297	1.6	1.6	1.4	0.6	2.4	0.4	0.5	0.3	8.9	Do.
5981	1.6	1.6	1.4	0.6	2.3	0.4	0.7	0.3½	8.6	Do.
5982	1.6	1.5	1.4	0.6	2.3	0.4	0.6	0.3	8.6	Do.
5983	1.6	1.5	1.4	0.7	2.2	0.4	0.5	0.3	8.6	Do.
5318	1.6	1.6	1.4	0.7	2.3	0.4	0.5	0.3	9.0	Do.
5339	1.8	1.6	1.3	0.6	2.3	0.4	0.4½	0.3	9.3	Do.
5340	1.6	1.5	1.4	0.6	2.2	0.3	0.5	0.3	9.3	Do.
	1.6	1.6	1.3	0.6	2.2	0.3½	0.5	0.3	8.11	Do.
5341	1.6	1.6	1.3	0.7	2.2	0.4½	0.5	0.3	8.10	Do.

List of specimens.

Catalogue number.	No. of specimens.	Locality.	Presented by—	Nature of specimens.	Collection.
5297	36	Carlisle, Pa	S. F. Baird	In alcohol	U. S. National Museum.
5433	1	do	do	Dry skin	Do.
5375	1	Washington	(?)	In alcohol	Do.
5298	1	do	C. Girard	do	Do.
5440	1	Hampshire Co., Va	M. M'Donald	Dry skin	Do.
5340	2	Clark Co., Va	Dr. Kennerly	In alcohol	Do.
5339	1	Mount Vernon	(?)	do	Do.
5341	1	Whitfield Co., Ga	A. Gerhardt	do	Do.
5442	1	Georgia	W. Cooper	Dry skin	Do.
5343	1	New Orleans	N. O. Acad	In alcohol	Do.
5401	1	St. Louis, Mo	Dr. G. Engelmann	do	Do.
5318	1	Cairo, Ill	R. Kennicott	do	Do.
5360	1	Poteau Creek, Ark	Dr. G C. Shumard	do	Do.
5371	3	Matamoras, Mex	Lt. Couch (Berl. Col.)	do	Do.
5439	1	United States	Major Leconte	do	Do.

2. **Vesperugo hesperus** H. Allen. The western bat. (Plates XX, XXI.)

Scotophilus hesperus H. Allen, Monog. N. A. Bats, 1864, 43.
Vespenego hesperus True, Proc. U. S. Nat. Mus., 1887, 515.
Vesperugo merriami Dobson, Ann. & Mag. Nat. Hist., (v), XVIII, 1886, 124.

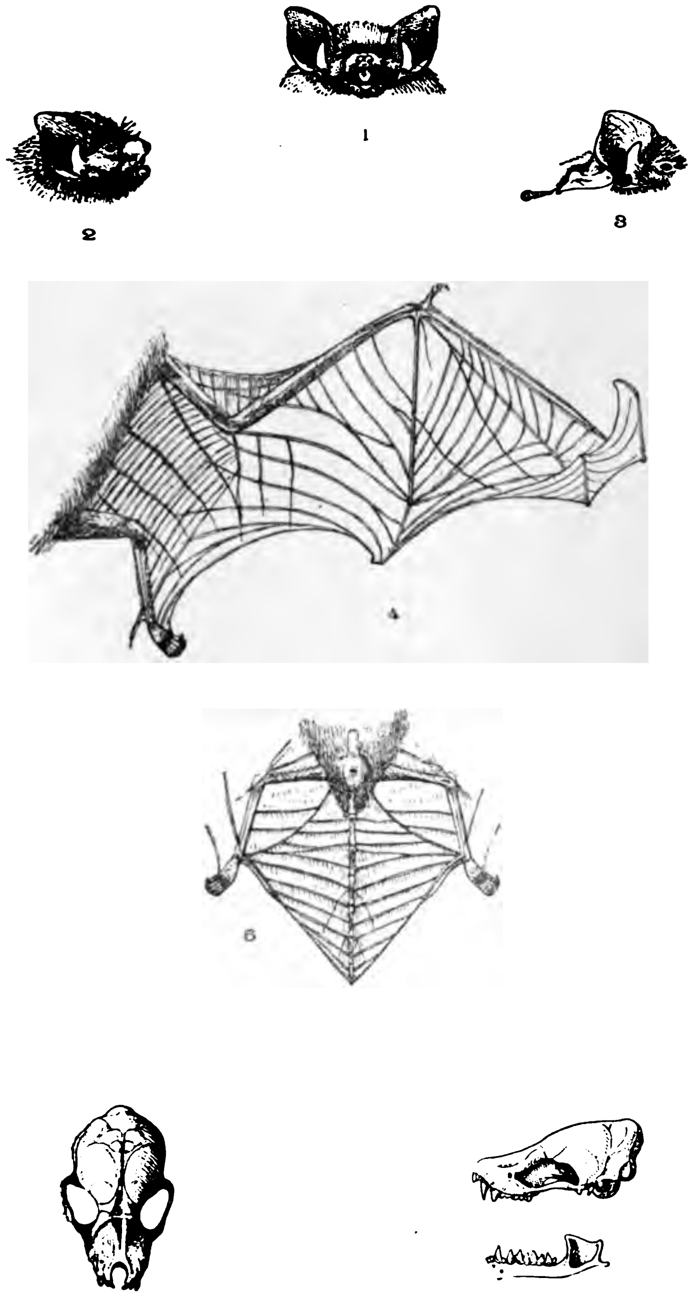
Diagnosis.—Smallest bat in the fauna; forearm 26^{mm}. Tragus not half the height of the auricle; inner border concave; outer convex tip blunt. Lower scallop slightly revolute; external basal lobe not revolute oblique; base scarcely wider than the narrow blunt tip; interfemoral membrane ample with post calcaral lobe; tail extended one-half its length beyond the ankle. The metacarpal of the third digit as long as the forearm; the first phalanx of the same shorter than the second. The second digit not longer than the third metacarpal bone. Foot larger than the thumb, equals over one-fifth of the length of the forearm. Penis cylindroid. In the third maxillary molar a trace of the last limb of the second V is discernable. Transverse line on the interfemoral membrane interrupted at the pubotibial line.

The manal formula is expressed as follows:

	Millimeters.
First interspace	1
Second interspace	6
Third interspace	22
Forearm	26

EXPLANATION OF PLATE XX.

FIG. 1. Front view of head of *Vesperugo hesperus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2



VESPERUGO HESPERUS.

Description.—Ears oval;* the anterior border of the ear sharply convex, inclining backward and upward to the rounded tip; the upper half of the posterior border is concave and without scallop. The lower half is provided with a small, reverted scallop, which is continuous with that of the space between the external ridge and the nonrevolute slightly tapering, external basal lobe; a delicate flang extends from the lobe to the angle of the mouth.

The fur is thicker on dorsum than on venter. It is black at the basal two-thirds and dark gray verging to light ocher or almost white, at the tips. It is lighter on the crown than elsewhere. On the venter the same colors prevail as on the dorsum, but the gray color is of a lighter shade and tends to become white. The fur is unusually compact on neck and below the lower jaw.

In No. 5406, U. S. N. M., the second digit is as long as the third metacarpal, *i. e.*, the phalanx does not extend beyond the third metacarpal phalangeal joint. The penis is slightly flattened and ends in a moderately expanded prepuce.

Membranes.—Intercostals three in number, the lowest appearing at the knee and passing to the free margin of the endopatagium. Coraco brachialis fascicle appears at the middle of the humerus; it is simple and apparently joins a vertical line which is extended downward from the elbow. The triceps fascicle system with a single inferior line, but with no superior obliques. The fourth interspace with digital nerves as in *Vespertilio*, in this regard markedly differing from other examples of *Vesperugo* which have been examined. The interfemoral membrane is provided with a pubocalcaneal line.

Mr. Dobson is inclined to believe that *V. hesperus* is identical with *V. abramus*, an old world species of extensive range being found in middle Europe, the oriental region, and the northern part of the Australian region (see Appendix). But American zoölogists have not agreed with this opinion. Mr. F. W. True has made this question the subject of a special note (Proc. of the U. S. Nat. Mus., 1887, p. 515) and concludes that *V. hesperus* is "distinct and valid." Mr. Dobson describes a specimen of *Vesperugo* from North America under the name of *V. merriami*. This specimen I have not seen. Mr. True believes that it is the same as the *V. hesperus* of the monograph. This is conclusive that Mr. Dobson after examining *V. hesperus* (as identified by Mr. True) did not recognize it to be the same as *V. abramus*, but a distinct species. The material upon which the original description was based was imperfect. It consisted of two dry, imperfect skins and a single alcoholic specimen. It has been obtained since in abundance.

Maxillary teeth.—Incisors both conical and unicuspid. The median the larger. A small space between the lateral and the canine. The first premolar minute as in *Atalapha* and wedged in between canine and second premolar inside the longitudinal axis of the tooth row. The remaining teeth much as in *Vesperugo carolinensis*, excepting in the last molar, where a trace of the last limb of the second V is discernible. The drawing exhibits this rudiment a little longer than is the average.

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* In the monograph, the statement on page 44 that the ears are rounded is an error.

Mandibular teeth.—The lower incisor with third tooth contiguous with second incisor and with canine. The first premolar in firm contact with the canine. In other respects the teeth are as in *Vesperugo carolinensis*.

Skull.—No trace of posterior temporal crests or sagittal crests are seen. The anterior temporal crest is well defined. The mesencephalon three and one-third times the length of the skull. No nasal eminence is seen; a shallow groove is present at the anterior third of the face vertex; back of this groove lies a well-defined oval pit. The infraorbital canal is as in *A. fuscus* Both the groove and the pit are sharply limited at the sides by lateral ridges. The upper surface of the maxilla is depressed.* The paroccipital process is rudimentary and scarcely visible. The tympanic bone is incomplete above.

Notes on the skeleton.—The bones much the same as in *Vesperugo carolinensis*. The free end of coracoid with long process on the vertical side instead of the small tubercle of the species just named. The pectineal spine ot the innominate bone aciculate, long, equaling one-fifth the length of the ilium. The thyroid foramen is subround, the ischium narrow, the tuberosity prolonged, the posterior border of the innominate nearly horizontal. Sacrum composed of four elements.

Habitat.—*Vesperugo hesperus* ranges from the low, hot plains of Mexico upward into the Californian basin through the valley of the Colorado River and the surrounding country. Dr. Merriam informs me that it is never found in the mountains and the limit of its distribution is sharply limited to the lower ranges of hillsides and to the plains. According to the same observer (N. A. Fauna, No. 3, 1890, 37) *V. hesperus* is found in swarms in the Grand Cañon of the Colorado River. It inhabits the crevices of the cliffs and is often found drinking from springs. "The flight of this species is so swift and zigzag that it is a very difficult species to shoot in the rapidly failing light. The young, as usual among bats, fly more slowly and steadily and are easily killed." It inhabits crevices in cliffs and begins to fly before dark in the evening, at which time swarms of them come up over the brink of the cañon and flit about among the pines and piñon.

Measurements.

[San Sebastian, Cal. ♂ Cal. Acad. Sci.]

	Millimeters.
Head and body (from crown of head to base of tail)	26
Length of arm	16
Length of forearm	26
First digit:	
Length of first metacarpal bone	1
Length of first phalanx	1½
Second digit:	
Length of second metacarpal bone	26
Length of first phalanx	1

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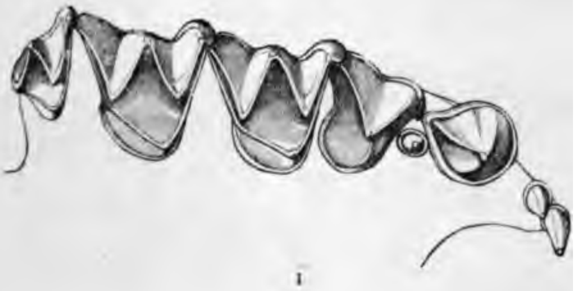
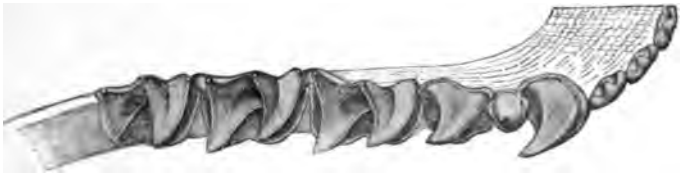
*The hard palate is depressed, saucer-shaped, *i. e.*, is equally concave from before ckward and from side to side.





1. Maxillary teeth of Vesperugo hesperus. × 16.
2. Mandibular teeth of same. × 16.

Measurements—Continued.

	Millimeters.
Third digit:	
Length of third metacarpal bone	26½
Length of first phalanx	6
Length of second phalanx	9
Fourth digit:	
Length of fourth metacarpal bone	25
Length of first phalanx	7
Length of second phalanx	6
Fifth digit:	
Length of fifth metacarpal bone	25
Length of first phalanx	5
Length of second phalanx	4
Length of head	13
Height of ear	10
Height of tragus	...
Length of thigh	11½
Length of tibia	10
Length of foot	4½
Length of tail	28

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of forearm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
5406	1.4	1.0	1.1	0.5	1.8	0.1	0.3	0.1½	7.0
6015	1.4	?	1.1	0.5	1.6	0.1½	0.5½	0.1½	?
5510	1.9	0.11	1.4	0.4	2.0	0.1½	0.4	0.1	7.0

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5406	1	Fort Yuma, Cal	Maj. G. H. Thomas	Alcoholic.	U. S. N. M.
5510	1	Posa Creek, Cal	Dr. A. L. Heermann	Dry	Do.
5509	1	do	do	do	Do.

Genus **NYCTICEJUS** Rafinesque.

Nycticejus Rafinesque, Journal de Physique, XXXVIII, 1819, 417.
Atalapha Coues and Yarrow, Wheeler's Exped., Zoöl., 1875–'87.

Diagnosis.—Bats with small tragus having a uniform convex outer border. Large head fold to auricle, scallops not revolute. Chin plate and upper lip at muzzle well defined, the former not triangular. Tip of coracoid process broader than base and deflected toward the vertebral border of the scapula. A single conical upper incisor on each side not touching canine. Face naked. The manal formula is as follows:

Dental formula.—Molars $\frac{3}{3}$, premolars $\frac{1}{2}$, canines $\frac{1}{1}$, incisors $\frac{1}{3}$ $\times 2 = 30$.

Nycticejus has the dental formula of *Dasypterus*. It is distinguished from this genus by the fact of the axis of the paracone of the upper premolar, if produced, intersecting the protocone near its anterior border, and by the upper incisor being separated by an interval from the canine.

	Milimetres.
Second interspace	1½
Third interspace	8–9½
Fourth interspace	26–27½
Forearm	18–20

By the number of upper premolars and incisors *Nycticejus* approximates *Scotophilus*, *Rhogeëssa*, and *Atalapha*. Coues and Yarrow, indeed, (Wheeler's Expedition, 1875), place it with the genus last named. Mr. Oldfield Thomas is inclined to place it with *Vesperugo* (see *infra*). In my opinion the structural peculiarities are of a character which warrant a separate generic diagnosis. The nearest ally of *Nycticejus* is *Rhogeëssa*, which may be said to represent it in the South American fauna. In the details of the molars and of the wing membranes it is unlike any of the forms of our fauna, but most resembles *Adelonycteris* and *Vesperugo*. Until Peters identified the *Scotophilus* of Leech, *Nycticejus* was thought to be distributed throughout the tropical belt of the Old World. It is now held to be confined to the warm southern parts of the United States and Central America.

O. Thomas (quoted in Mammals Living and Extinct, Flower and Lyddeker, 1891,) credits *Nycticejus* to *Scotophilus*. I can not agree with this determination. In *Scotophilus* the last upper molar is like *Atalapha*; in *Nycticejus* it is like *Vesperugo*. The details of the lower molars are absolutely different. The hypoconid in *Scotophilus* is small, narrow and blunt; the triangle composed of blunt cusps with shallow interspaces. The hypoconid is large, larger than the triangle (which is compressed from behind forward as in *Nyctinomus*), and has high aciculate cusps. The character of elbow-movement is distinct in the two forms. In *Scotophilus* the inner radial facet on the humerus is weak, scarcely at all concave. The joint is strengthened by a bold, trenchant epitrochlea. In *Nycticejus* the inner radial facet on the humerus is deeply concave and sharply defined, thus strengthening the joint, while the epitrochlea is small and feeble. The palate is prolonged backward markedly in *Scotophilus*, but scarcely at all in *Nycticejus*.

1. **Nycticejus humeralis** O. Thomas. (Plates XXII, XXIII.)

Nycticejus crepuscularis Leconte Cuv. An. Kingd. (McMurtrie's ed.), 1831, 432; Jas. Leconte, Acad. Nat. Sci. Phila., 1855, 433; H. Allen, Monog. N. A. Bats, 1864, 12, figs. 9–11.

Vespertilio creeks F. Cuv., Nouv. Annal. du Mus., Paris, I, 1832, 18.

Vespertilio aenobarbus Temminck, Monog. Mam., 1835–'41, 247, Pl. 58, Fig. 4, *vide* Peters, MB. Akad. Berl., 1866, 681.

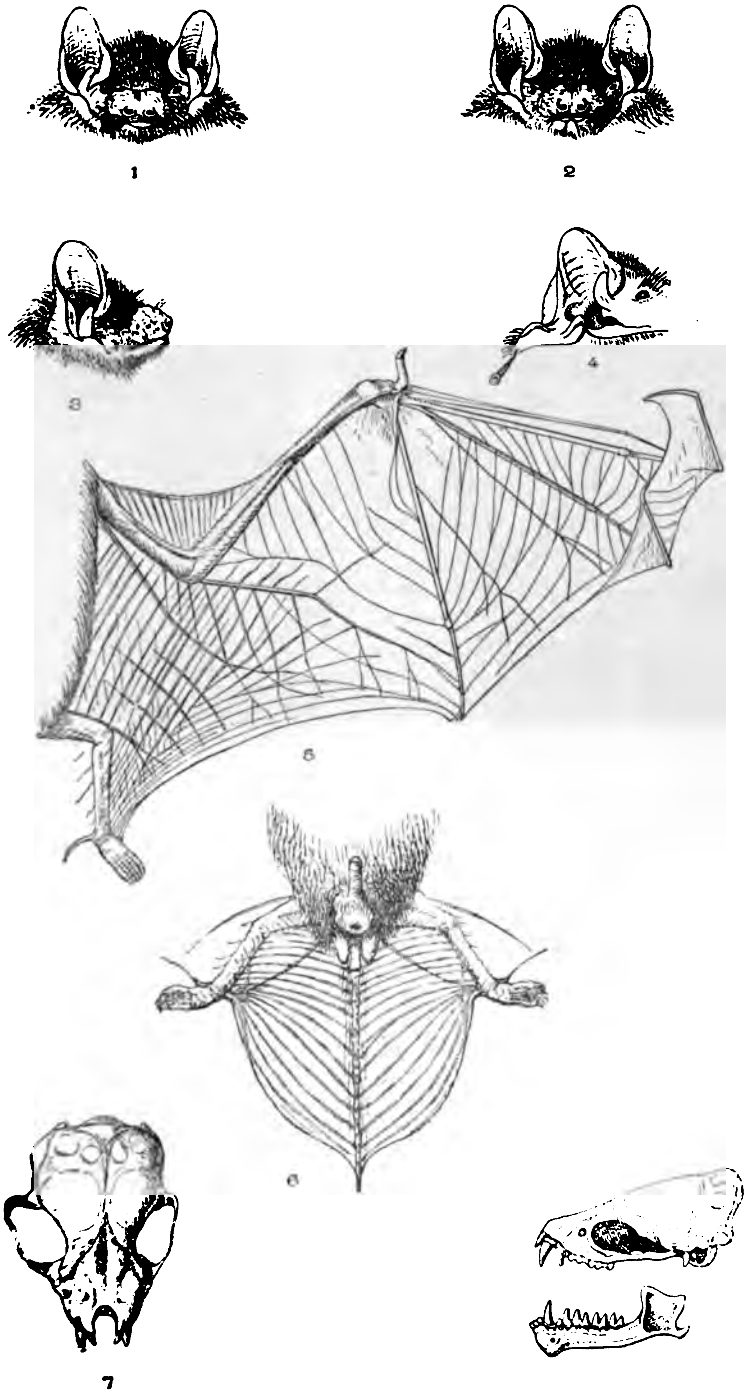
Vesperus cubanus Gundlach, MB. Akad. Berl., 1866, 681.

Nycticejus humeralis O. Thomas. Ann. & Mag. N. H. VII, 1891, 528.

In the monograph of 1864 I queried whether or not *N. humeralis*, Rafinesque, was the same as *N. crepuscularis*. I have since concluded that they are the same and, therefore, agree with Mr. Oldfield Thomas in accepting this name.

Diagnosis.—The diagnosis of the single species, that of the genus.

—Auricle small, shorter than the head, the portion above outer border scarcely concave, tip obtuse. Internal , thick, interiorly forming a minute pendant point; abruptly convex; it does not touch the head, but is raised



NYCTICEJUS HUMERALIS.

therefrom by the head-fold. The keel (internal basal ridge) prominent, well defined. External basal lobe well developed, nearly naked, with base placed well below the line of the mouth and its anterior border nearly at right angles therewith. The external basal ridge continues with the external border of the auricle and constitutes the margin of the first scallop, which is thus obscurely defined. The second scallop is well-outlined, convex, and ends on the outer surface of the external basal lobe. The tragus is nearly one-half the height of the auricle; the broadest part extends from the inconspicuous notch to the apical third, where it abruptly narrows to a blunt tip; the anterior border is straight or slightly concave, the posterior convex ("dolabriform" Leconte). The mentum is well defined and, as a rule, undivided. The pollical callosity is round, conspicuous, 2^{mm} wide. No post calcaral lobe or lobe at tip of the calcar (apici calcaral lobe) is present. A wart is placed well below the angle of the mouth.

Dorsum throughout of a light ash-grey color, the basal, one-third to two-thirds, being dark-brown. Venter the same, with the brown hues of the shafts being more conspicuous. The sides of the neck less ash than elsewhere, hence the effect of this region is that of nearly brown throughout. The degree of ashy hue of the dorsum is variable in specimens from one locality and may be absent when the hair is uniformly brown, the shaft simply being darker in shade than the tip. The venter is quite constant in color in all individuals examined.

The material available for study is not sufficient for me to decide which of the two styles of coloration of the dorsum is the most frequent. It may be that the grey variety is a sign of advanced maturity, all the examples were those of lactating females, although some of the brown variety were also in the same condition.

On the dorsum the hair extended to the middle of the humerus and downward thence to the knee. The interfemoral was turned only at the basal fourth. In the venter the hair extends on the humerus only as far as the end of the pectoral ridge and on the thigh to the proximal and thence along the side of the body to the middle of the thigh. The lower fourth of the interfemoral was alone furred.

Variations.—In No. 6060 Arkansas (M. C. Z.) the post-calcareal lobe is present. The tragus is less than one-half the height of the auricle. The last caudal vertebra is free.

In No. 8172 U. S. N. M. (Carlisle, Pa.) is similar to the Southern form, except that the external basal lobe is as high as it is long, and the summit is surrounded, and the inner border of the tragus straight. A large pendant skin-fold extends the entire length of the right side of space below the lower jaw. This asymmetrical fold is of interest since no similar disposition exists so far as I know in any other bat.

In No. 4735 U. S. N. M. the fur on the dorsum is everywhere dark, lustrous brown at the apical third, and black at the basal; two-thirds on the rump it is brown throughout. On the venter the apical tints are lighter.

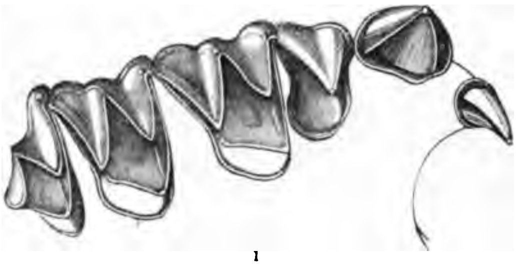
Membranes.—Intercostals four in number. The coraco-brachialis fascicle appears near the axilla and becomes vertical a little beyond the elbow. The triceps fascicle system with a single superior oblique and a single vertical inferior branch. The line above the main trend of the nerve as in *A. fuscus.* The fourth interspace as in this species except that the postdigital appears at the proximal sixth of the fourth metacarpal bone. In one specimen it was absent. The oblique tibial and pubo tibial lines as in this species. In No. 4378 the lines in the fourth interdigital space arise from the digits, the postdigital from the proximal third and the predigital from near the middle.

Skull.—The sagittal crest is defined its entire length. The posterior temporal ridge is trenchant, limiting a small triangle. The anterior temporal ridge is also well defined and ends on the orbital ridge which is sharply outlined, and is continuous with an oblique line which crosses the flat inner wall of the orbit. The fronto-maxillary inflation is rudimental,—the least developed in any of the species. The face-vertex is without depression in some examples; in others it is shallow, and less than half the length of the region. (Such specimens may not be entirely mature.) Two shallow depressions overlie the maxillæ. The facial infraorbital foramen lies over the interval between the second premolar and the first molar. The anterior nasal aperture ends on the line of the anterior border of the second premolar. The paroccipital process is acuminate and projects downward no farther than the level of the inflated mastoid. The interval between these two processes is concave and incised below. The tympanic bone is incomplete above the head of the malleus intervening. The coronoid process lies above the level of the condyle and slightly exceeds the width of the adjacent horizontal ramus. The massetric impression reaches the lower margin of the ramus. The angle is small, truncate, and slightly produced beyond the line of the condyle.

The encranial surface is about one-third the area of the entire region, the cribriform plate marked as follows: First, a single opening is seen on the sphenoturbinal surface; second, two openings on the ectoturbinal surface; third, a relatively large depression on the endoturbinal, containing two openings, well to the lateral aspect, for the first endoturbinal plate.

The nasal surface exhibits a single ectoturbinal plate. It is a little less than one-half the length of the first endoturbinal, is directed almost vertically downward, the swollen upper border looking outward. The lateral surface is concave, deflected outward as far as the tip of the first endoturbinal. It is slightly concave above. The free portion is acuminate, reaching as far as the level of the canine tooth. The second plate is as in *V. fuscus*, but not so much narrowed at the base. The third is a mere rounded nodule.

Maxillary teeth.—The incisor slender, simple, with entire cingulum vertical on border of palatal notch; a small space between it and the canine. The palatal surface of the canine concave, broad; posterior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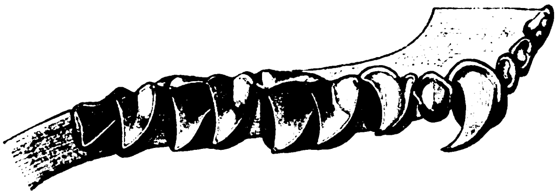
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1. Maxillary teeth of Nycticejus humeralis. X 12.
2. Mandibular teeth of same. X 12.

narrow concave in line with longitudinal axis of tooth row; borders abrubtly raised, thin. Single premolar not distinctive. The Vs of the first and second molar subequal; the protocone with obscurely defined posterior commissure which ends at the apex of the second V. The heel is rudimental, its apex appearing on the top of the protocone. The third molar with protocone as in the other molars, but the posterior limb ot the second V absent.

Mandibular teeth.—The incisors crowded. First with trifid cutting edge, more inclined forward than the second and third, which are blunt, thick, and bearing a mere nodule on the cutting surface. Canine with broad concave posterior and narrow concave lingual surface, the two separated by a sharp longitudinal flange. The heel like base, low and broad. The first premolar wedged in tooth row by the basal lines of the adjacent teeth; much smaller than the second, with the lingual cingulum angulated. The second premolar with anterior basal cusp on lingual part of the cingulum advanced. The first and second molars not distinctive. The third molar with a small deflected heel, which, while triangular, is much compressed from without inward.

Notes on the skeleton.—Atlas with minute spine from the transverse lamina; the lower of the two foramen not seen from in front. Axis without lateral oblique spine.

Scapula with thin axillary border; triceps impression without rugosity or spine; the superior angle scarcely inflected; tip of the coracoid process is broader than the base and is deflected toward the vertebral border. Humerus with internal tuberosity not higher than head and of about the same size as the external tuberosity. Ulna in some specimens anchylosed to radius at proximal end. Apparently attached to this bone about at distal third of the shaft, but in fact ending free as as in *Adelonycteris*, *Vesperugo*, and *Vespertilio*. The distal end with square perforated lamina. Innominate bone with narrow subrounded ilium not expanded above. Proximal end of tibia with large spine The first metacarpal bone equals the phalangeal series in length.

Sexual characters.—The proportion of the sexes could not be determined by the material available. Many of the specimens examined (all of those from Carlisle, Pa., N. M.) were lactating females, while of the nine specimens in the Museum of Comparative Zoology seven were males. The penis (see specimen No. 1185, Cam. from Seabrook Island, South Carolina) is long (8^{mm}), pendulous, cylindrical, and without expanded prepuce. In this respect the parts are quite dissimilar to *A. fuscus* and closely resemble *Atalapha*. Testis on side of base of tail.

The brain.—The flocculus of the cerebellum not projected. The anterior portion of cerebrum (rhinocele) abruptly constricted from the pyriform figure of the hemisphere.

Habitat.—This species has not been recorded in the United States in regions beyond the South Atlantic slope and the country extending west to the Mississippi and north to the Middle States as far as Pennsylvania. One specimen was formerly in the Smithsonian Institution, collected from Nebraska; several from Arkansas, and one from Matamoras, Tex. Dobson's statement that it is found in the Rocky Mountains is not accompanied by reference to collections. There is one specimen in the British Museum from Central America.

Measurements.

	U. S. N. M. 4735 ♀ skin.	U. S. N. M. 5329 ♀ alcohol.	M. C. Z. 4378 ♂ alcohol.	M. C. Z. 1185 ♂ ——.
	Mm.	*Mm.*	*Mm.*	*Mm.*
Head and body (from crown of head to base of tail)	37	37	36	39
Length of arm	18	18	19	20
Length of forearm	32	35	30	34
First digit:				
Length of first metacarpal bone	2	2	2	2
Length of phalanges	3	5	3	3½
Second digit:				
Length of second metacarpal bone	30	32	28	29
Length of first phalanx	2	3	2	2
Third digit:				
Length of third metacarpal bone	32	33	30	32
Length of first phalanx	12	12	11	12½
Length of second phalanx	10	9	9	....
Fourth digit:				
Length of fourth metacarpal bone	31	33	30	31
Length of first phalanx	11	12	10½	11
Length of second phalanx	8	7	6½	....
Fifth digit:				
Length of fifth metacarpal bone	29	33	29	30
Length of first phalanx	6½	8	6½	8
Length of second phalanx	....	4	4	4
Length of head	15	....	15	16
Heighth of ear	8	....	8	7½
Heighth of tragus	3	....	3	3½
Length of thigh	10	10½	11	10
Length of tibia	11	11	14	12
Length of foot	6	....	6	7
Length of tail	30	30	30	31

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5312	2.0	1.5	1.4	0.6	2.6	0.4	0.4	0.2½	9.6	Alcoholic.
	2.0	1.5	1.4	0.6	2.6	0.4	0.5	0.2	9.9	Do.
	2.0	1.5	1.4	0.6	2.5	0.3	0.4	0.3	9.3	Do.
5313	2.0	1.4½	1.4	0.6	2.6	0.3	0.4	0.3	9.3	Do.
5322		1.5	1.4	0.6	2.6½	0.4	0.5	0.3		Do.
5329	2.0	1.2	1.3	0.6	2.3½	0.4	0.4	0.2½	9.3	Do.
	2.0	1.2	1.6	0.6	2.7	0.4	0.4½	0.2½	9.9	Do.
4735	2.0	1.2	1.3	0.6	2.5	0.4	0.4	0.2	3.6	Dry.
4736	2.0	1.2	1.3	0.6	2.1	0.3	0.3½	0.2	7.9	Do.
111	1.6				2.2	0.3	0.4	0.2		Do.
283	1.9	1.4	1.4	0.6	2.2	0.3	0.4	0.2½	7.6	Do.
882	2.0	1.3	1.5	0.6	2.4	0.3	0.6½	0.3	8.0	Do.

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by	Nature of specimen.	Collection.
5448	1	Carlisle, Pa	S. F. Baird	Dry	U.S.N.M.
5350	1	Washington, D. C	(?)	Alcoholic.	Do.
5312	2	Liberty Co., Ga	Dr. Jos. Jones	....do	Do.
5313	1	New Orleans	N. O. Academy	....do	Do.
5300	1	St. Louis, Mo	Dr G Engelmann	....do	Do.
5322	1	Nebraska	Dr Cooper	....do	Do.
5397	1	F .mond's Ranch, Tex	J H Clark	....do	Do.
5372	3	Matamoras, (Berl. Col.)	Lt. D N Couch	....do	Do.
5329	2	.....do	.....do	....do	Do.
4736	1	"United States."	Maj. Leconte	Dry	Do.
5539	1	(?)	(?)	....do	Do.

Genus **DASYPTERUS**, Peters.

Dasypterus, Peters, MB. Akad. Berlin, 1870, 904.
Atalapha, Peters, MB. Akad. Berlin, 1870, 912; Dobson, Cat. Chirop. Brit. Mus., 1878, 274.
Lasiurus, H. Allen, Proc. Acad. Nat. Sci. Phila., 1862, 146; Monog. N. A. Bats, 1864, 25.
Nycticejus, Coues and Yarrow, Wheeler's Exped., Zoöl., 1875, 87.

When I described this form I placed it with *Lasiurus*, but Prof. Peters proposed for it a distinctive generic name, *Dasypterus*, since it possesses one premolar only in the upper jaw. In the propriety of making this change I concur.

Dental formula.—Molars $\frac{3}{3}$ — premolars $\frac{1}{2}$ — canines $\frac{1}{1}$ — incisors $\frac{1}{3} \times 2 = 30$.

Diagnosis.—Ears elliptical; tragus incurved, blunt, with a transverse ridge on the outer surface. The internal basal lobe projects backward beyond the internal ridge. Back of ample interfemoral membrane scarcely hairy. The phalanges of the third digit equal in length. The first phalanx of the fourth and fifth finger longer than the second. The olecranon is free behind—the membrane concealing the region of the elbow in front.

The axis of the paracone of the upper premolar, if produced, intersecting protocone near at its middle. The upper incisor in contact with the canine. (See *Nycticejus*.) The resemblance of the teeth of this genus to those of *Antrozous* have been already noted.

The manal formula is as follows:

	Millimeters.
Second interspace	2
Third interspace	14
Fourth interspace	40
Forearm	40

1. **Dasypterus intermedius** (Peters). (Plates XXIV, XXV.)

Lasiurus intermedius H. Allen, Proc. Acad. Nat. Sci. Phila., 1862, 146; Monog. N. A. Bats, 1864, 25.
Dasypterus intermedius Peters, MB. Akad. Berlin, 1870, 904.
Atalapha intermedia Peters, MB. Akad. Berlin, 1870, 912; Dobson, Cat. Chirop. Brit. Mus., 1878, 274.
Nycticejus intermedius Coues and Yarrow, Wheeler's Expedition, Zoöl., 1875.

Description.—Ears longer than broad, slightly emarginate posteriorly beneath the tip and without black border. The internal basal lobe as in *Atalapha*, but projects but little back of the inconspicuous keel. The external basal lobe rounded without basal notch anteriorly. Hem narrow; it is confined to the notch as in *Atalapha*. The tragus as in this genus; the transverse ridge on the tragus complete. Muzzle and chinplate as in *A. cinerea*. Wing membranes with markings quite as in *Atalapha*. A conspicuous muscle-mass lies between the long calcar and the foot. This incloses a muscle as in *A. noveboracensis*.

The tip of the tail is free. In specimen 6098, Museum of Comparative Zoölogy, the mammary glands were large. The two nipples were near each other toward the axilla, without a furred surface intervening.

Hair everywhere long and silky. Dorsum, including the head, neck, and ears, with hair at the basal half dark brown; apical half old gold. On the membrane from the proximal third of the arm to the knee the hair is the same as on the body. It is longer than the hair in similar positions in the red bat or the hoary bat. A light-brown tuft overlies the first metacarpal bone, and the prebrachium above the elbow. Unicolored light-brown hair sparsely covers the interfemoral membrane as far as a line that unites the ankles. The fleshy extension to the outer side of the calcaneum as in *Atalapha*. Ventre including the submental region and the neck, with basal two-thirds dark brown, apical third light brown; no shades of old gold are present. A sparse growth of light-brown, unicolored hair extends along the forearm its entire length and upon the metacarpus as far as the third digit. The end opatagium from the elbows to the knee is covered with hair having the same characters as the above.

No differentiations are seen on the side of the neck or of body. The ears are covered at the basal two-thirds.*

Membranes.—The markings on the wing membranes are so similar to those of *A. cinerea* that they need not be described. The propatagium is not withdrawn behind the ulna at any point.

Variations.—An example from Davenport, Fla., in the collection of Mr. G. S. Miller, jr., Cambridge, Mass., is described as follows:

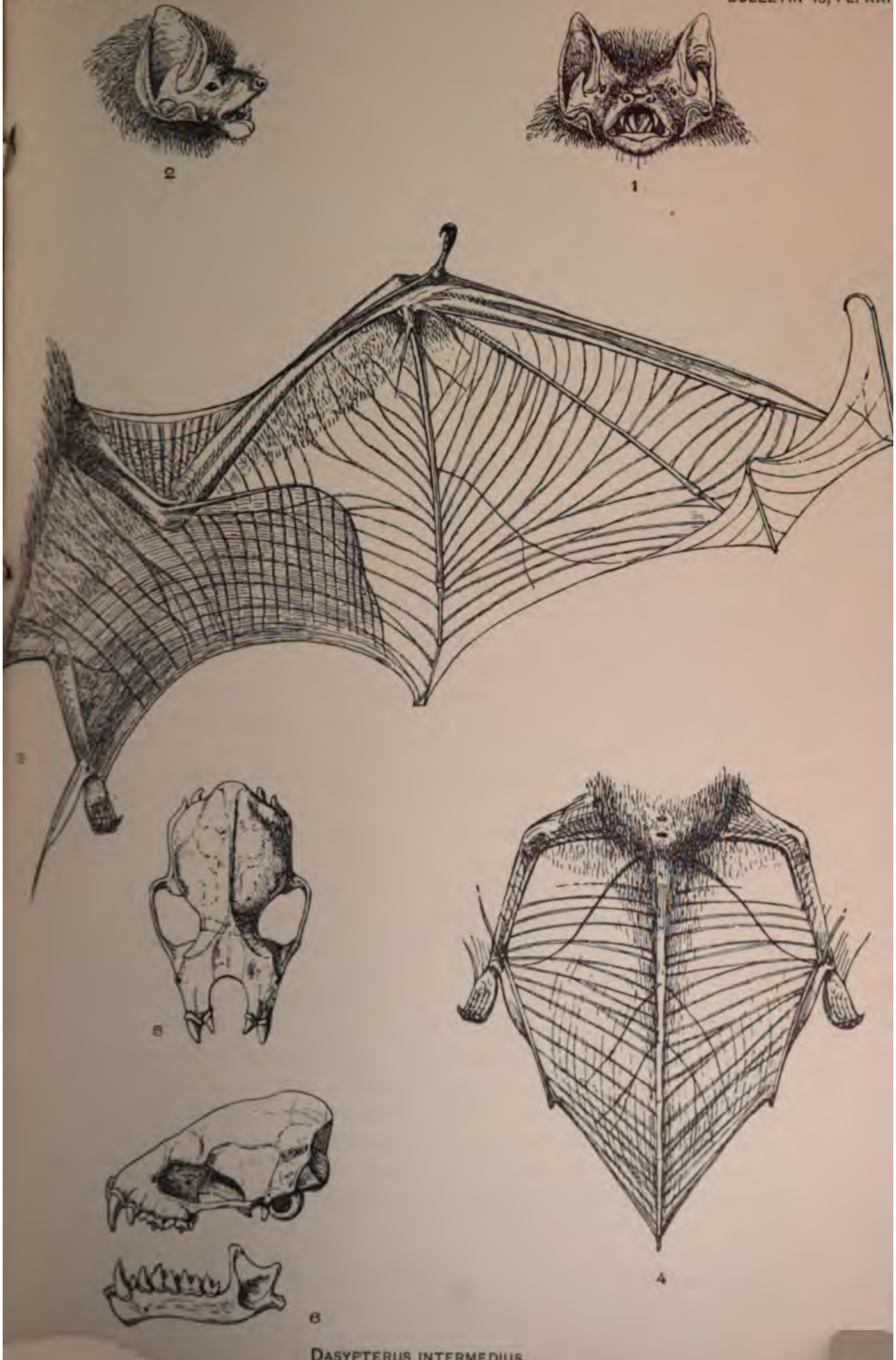
Dorsum of an obscure ocher-brown, flecked with dispersed transverse sooty lines. The color becomes more rusty over the loins and upon the basal half of the interfemoral membrane where it is of a dull russet. The basal fifth is black, the remaining portion is almost white. The subtip is ocher-brown and the tip occasionally black. On the interfemoral membrane the hair is of a dull Isabella brown; the basal black equals one-fifth of the shaft, which is scarcely lighter than the long tip. Thus the shaft is not lighter than on the dorsum. The fold extending from the auricle to the head is heavily furred. Of the two examples one, although the larger, was immature, showing that variation in the measurements of a number of individuals may be expected.

Teeth.—The maxillary incisors much as in *A. cinerea* and *A. noveboracensis;* the cingulum markedly developed; the first premolar is absent. The posterior commissure of the paracone does not reach the posterior border of the tooth, but adjuts against the anterior limb of the second V near its tip; the third molar as in other species.

**Dasypterus ega*, Peters.—A specimen of this species from the collection of the Museum of Comparative Zoölogy. The palatal rugæ are six in number. The lower incisors not trifid, subequal, the first the largest. The fur of the ventre is without tip of different shade to that of the shaft. The hair is of two colors, while on the dorsum it is of three.

EXPLANATION OF PLATE XXIV.

FIG. 1. Front view of head of *Dasypterus intermedius.*
FIG. 2. Side view of same.
FIG. 3. Wing membrane.
FIG. 4. Tail and interfemoral membrane.
FIG. 5. Skull seen from above. x 2.
FIG. 6. Skull and lower jaw seen from the side. x 2.



DASYPTERUS INTERMEDIUS.

The mandibular incisors crowded; the first incisor much larger than the coequal second and third teeth; cutting edge trifid and palatal base produced; the second and third rounded, conoid, and blunt; they are made obscurely bifid in front; the first premolar not more than half the size of the second; the molars quite as in other species.

Skull.—The greatest length is 17^{mm}. The length of mesencephalon is 5^{mm}. The greatest width is 10^{mm}; the least width 5^{mm}. A delicate sagittal crest extends the entire length of the metencephalon and half way over the mesencephalon. The posterior temporal crests are almost parallel with each other over the posterior half of the mesencephalon near the dorsal median line, leaving a conspicuous space which is the homologue of the triangular interval in other genera. The anterior temporal crest is well defined and ends on the orbital crest. The paroccipital process is large, conical directed, backward, and its line intersects the condyle above its center. The mastoid process is slightly produced, but less so than is the paroccipital. The intermediate space is scarcely convex and deeply incised. The tympanic bone is complete. No tubercle lies above the proencephalic foramina. The orbital crest is small and is placed well forward and involves the lachrymal bone. The infraorbital canal is placed high above the teeth; is exceedingly short, permitting a mere rim of bone to lie between the orbital and the facial foramen. The lachrymal foramen is inconspicuous, almost concealed in profile. The line produced from the upper border of the anterior nasal aperture intersecting the first molar. The fronto-maxillary inflation moderately developed and is best defined at the lachrymal region. The lingual process reaches the tympanic bone. The tympanic ring is complete. The zygoma is without elevation on the upper border.

The coronoid process is not as high as is the horizontal ramus. The masseteric impression is weak inferiorly and not quite reaching the lower border of the horizontal ramus. It scarcely impresses the coronoid. The angle forms a flat quadrate process, deeply concave on median aspect and extends scarcely beyond the condyle. As seen from above, it lies in line with the middle of the condyle. The posterior symphysal spine is conspicuous.

Notes on the skeleton.—The triceps impression of the scapula bends more to dorsum than to venter. The glenoid is absolutely straight on median surface excavated above on lateral but very convex inferiorly on same side. The infra-spinous portion of venter with a stout ridge ranging downward and backward from the compact tissue at glenoid. This ridge answers to the concavity on dorsum. In both human and bat scapula the stoutest ridge on venter answers to the deepest concavity on dorsum. In the human variety this lies near the axillary border; in the bat at middle of the dorsum.

Habitat.—Mexico and the Gulf States. It is a rare species and nothing is known of its life history. The type specimen was obtained at Matamoras, Mexico.

Measurements.

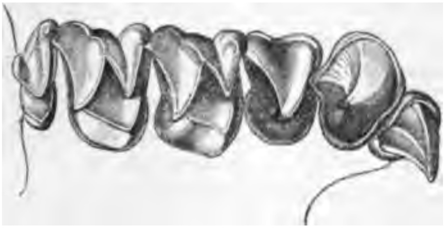
	U. S. N. M. 5382. Immature.	M. C. Z. ♀
	Mm.	*Mm.*
Head and body (from crown of head to base of tail)	....	61
Length of arm	....	28½
Length of forearm	54	49
First digit:		
Length of first metacarpal bone	4	4
Length of phalanges	5½	5
Second digit:		
Length of second metacarpal bone	57	54
Length of first phalanx	2½	7
Third digit:		
Length of metacarpal bone	58	55
Length of first phalanx	20	20
Length of second phalanx	20	20
Fourth digit:		
Length of fourth metacarpal bone	55	49
Length of first phalanx	15	13
Length of second phalanx	13	11½
Fifth digit:		
Length of fifth metacarpal bone	46	44
Length of first phalanx	9	7½
Length of second phalanx	8	7½
Length of head	21	21
Height of ear from head	7	8
Height of tragus	7	7
Length of thigh	18	18
Length of tibia	23	21
Length of foot	7	8
Length of tail	58	50
Length of calcar	18	16

Measurements, from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Ex-panse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5328	3.0	2.6	2.2	0.11	4.0	0.5	0.7½	0.3	13.0	Alcoholic.
6135	2.3	2.2	2.1	0.11	4.0	0.4½	0.7	0.2½	13.6	Do.
6138	2.9	2.7	2.1	0.11	4.1	0.4½	0.6½	0.3	15.9	Do.
6137	2.6	2.2	2.1	0.11	4.1	0.5	0.6½	0.3	13.3	Do.
6139	2.6	2.0	1.9	0.8	3.6	0.5	0.7	0.3	12.0	Do.
6140	2.5	2.0	2.0	0.11	4.0	0.3	0.7½	0.3	12.6	Do.
	2.5	2.0	2.0	0.9	2.6	0.5	0.6	0.3	13.0	Do.

List of specimens.

Cat. No.	Number of speci-mens.	Locality.	Presented by—	Nature of specimen.	Collection.
3228	1	Matamoras, Mex	Lt. Couch, U. S. Army (Berl. Coll.).	Alcoholic.	U. S. N. M.
6135	1	......do	......do	....do	Do.
6136	1	......do	......do	....do	Do.
6137	1	......do	......do	....do	Do.
6138	1	......do	......do	....do	Do.
6139	1	......do	......do	....do	Do.
6140	1	......do	......do	....do	Do.



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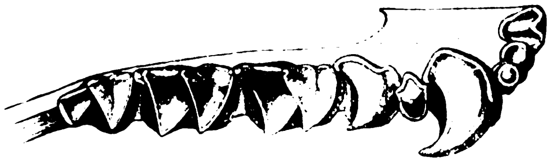

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1. Maxillary teeth of Dasypterus intermedius. X 12.
2. Mandibular teeth of same. X 12.

Genus **ATALAPHA** Rafinesque.

Atalapha Rafinesque, Précis des découvertes et travaux somiologiques, 1814, 12; Desmarest, Mam., 1820, 146; Gervais, Hist. Nat. Mam., I, 1854, 214; Peters, MB. Akad. Berlin, 1870, 907; Dobson, Cat. Chirop. Brit. Mus., 1878—Coues & Yarrow, Wheeler's Exped., Zoöl. 1875, 86.

Scotophilus Gray, Mag. Zoöl. and Bot., II, 1838, 498.

Lasiurus Gray, List Mam. Brit. Mus., 1843; Tomes, Proc. Zoöl. Soc. London, 1857, 34; Allen, Monog. N. A. Bats, 1864, 14.

In changing *Lasiurus* to *Atalapha* I have followed the tendency of all recent writers. I have never seen the original description of Rafinesque, and recalling the cloud under which most of the work of this eccentric naturalist rested, I thought it better to employ the name of *Lasiurus* of Gray which, although without characterization, was known to apply to a species already identified.

By reference to the diagnosis of *Atalapha fuscata* in the appendix it will be seen that it is impossible to name by its use any species of bat in North America, I assume that Rafinesque's original characterization of *Atalapha* has satisfied such observers as Gervais, Peters, and Dobson of its validity.

The skull without marked depression between the mesencephalon and the metencephalon. The labyrinth concealed at the occiput. A basisphenoid fossa is present. The glenoid tends to be pedunculated. The sacrum is broader below than above, with high coequal spines and composed of from four to five elements. The caudal vertebræ form a curved axis directed ventrad. The scapula with coracoid having a long process at the free end directed backward. The spine with nodule or facet-like process at the middle. The superior angle incurved and bears a process which deepens the subscapular fossa. The vertebral border depressed at supra-spinatus fossa and elevated at the infraspinatus fossa. The head of the humerus with an oblique articular surface; the internal tuberosity produced. The epitrochlea prolonged as a short spine; it serves to deepen the trochlea, besides affording attachment to a ligament and muscles. The epicondyle with a small spine anteriorly. The radius with a square shaft and marked with impressions for extensors of the carpus and thumb. The proximal ulnar rudiment is anchylosed to the radius—a slender thread-like shaft ending free at the proximal third of radius; the distal rudiment with a reverted spine. The manus with erect thumb, not disposed to lie with the second digit; the callosity rudimental, if present; not wider than the first phalanx. The second and fifth metacarpal bones stout, the latter shorter than the forearm, and concave on pollical border near the head for the elongated pisiform bone. The second phalanx of the third digit flexed at a right angle in repose and can not be brought to axial line with the first phalanx. In repose the third digit is much longer than the body and inferior extremity. The pectineal spine or the innominate bone reaches the upper lip of the acetabulum; the thyroid foramen is oval; the internal superior spinous process of the ilium is pointed. Femur with external trochanter triangular, with a horizontal upper border. Radiocarpal pouch defined; palmar folds present. The endopatagium with numerous vertical muscle fascicles, which form a curved diminishing series toward the manus. The membranes stretched across from the ventral borders of the large, distinct metacarpals. The occipito-pollical muscle receives an accession from the pectoralis muscle; it is held firmly at the forearm to the fascia over the extensor muscles. The cerebrum is acuminate; cerebellum is with lateral lobe (flocculus).

Maxillary incisors two, conical, touching canines, protocone small, with trace only of posterior commissure; third upper molar rudimental; first upper premolar minute and lies inside axis of dental series.

Atalapha is the most aberrant of any of the genera of the *Vespertilionidæ*, as this family is at present defined. It presents features in common with the *Molossi* and the *Phyllostomidæ*. The shape of the wing, especially as to the strength of the first metacarpal bone, the shortness of the fifth metacarpal bone as compared to others of its series, the rigidity of the phalanges of the fifth digit, the arrangement of the lines in the fourth interdigital space, the flexibility of the lips, the great height of the internal tuberosity and of the length of the epicondyle of the humerus, the reverted distal ulnar rudiment, the posterior deviation of the coracoid process, the presence of a distinct lateral lobe to the cerebellum, the number of the upper incisors (being restricted to two), and the general shape of the wing are as in *Molossi;* while the complete tympanic bone (forming a ring at the upper margin), the pisiform bone being palmad and articulating with the fifth metacarpal bone, the palmad distinctness of the metacarpal bones, the shapes and relative proportions of the ectoturbinals, the presence of numerous vertical raised muscle-bands on the endopatagium, the angle of the lower jaw not being deflected, but remaining in axial line with that of the horizontal ramus, the genus resemble the true *Phyllostomidæ.*

The following key will be of use in determining the species:

I. Border of ear light brown; no clumps of hair on forearm.
  a. External basal lobe of ear notched ....*A. noveboracensis* [p. 142].
  b. External basal lobe of ear not notched ....*A. teliotis* [p. 153].
II. Border of ear black; a clump of hair on dorsum of forearm ...*A. cinerea* [p. 155].

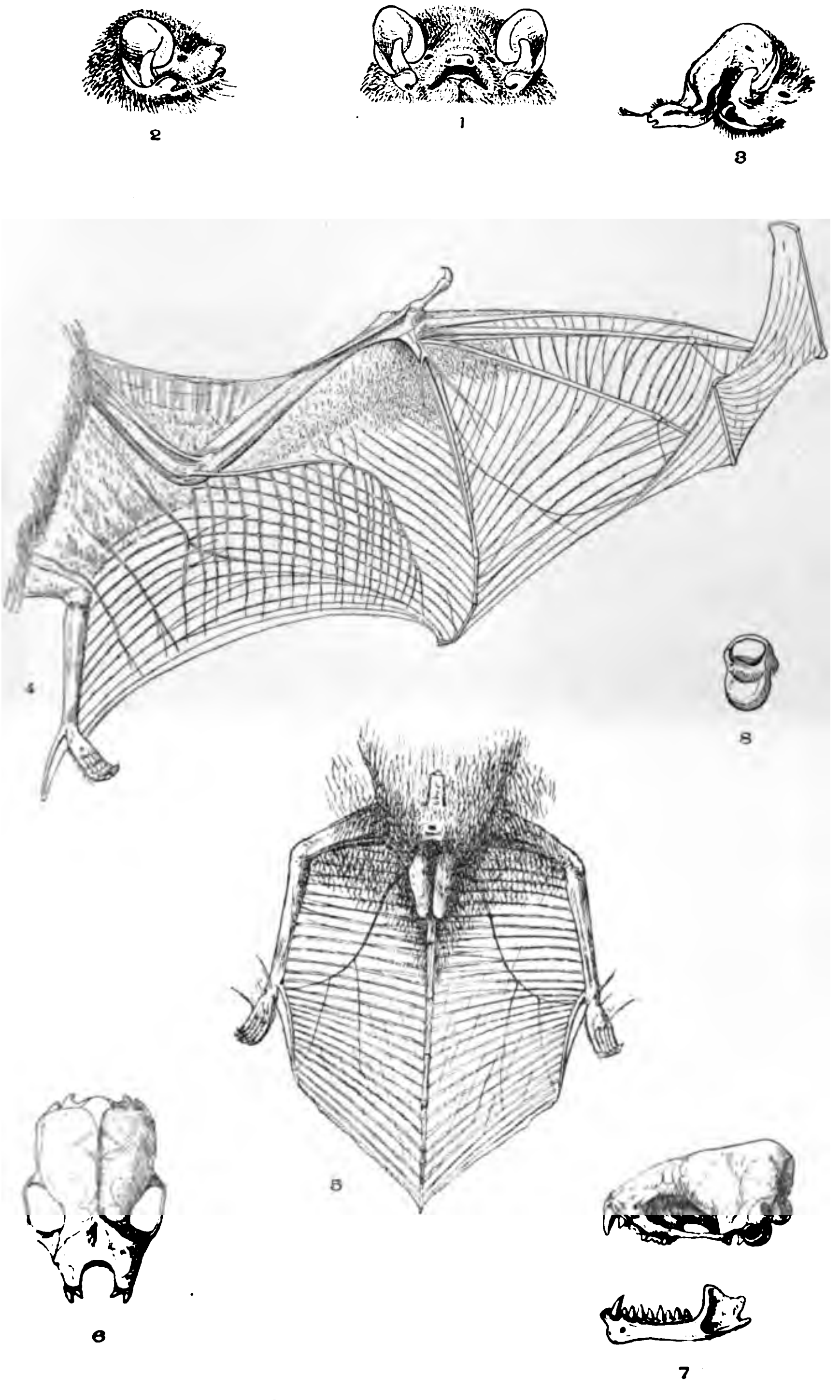
Atalapha noveboracensis (Erxleben). The Red Bat. (Plates XXVI, XXVII, XXVIII.)

Vespertilio noveboracensis Erxl., Syst. Reg. Anim., 1777, 135; Harlan, Fauna Amer., 1825, 20; Godman, Amer. Nat. Hist., I, 1826, 50; Cooper, Ann. Lyc. Nat. Hist. N. Y., 1837, 57; De Kay, Nat. Hist. N. Y. (Zoöl.), 1842, 6, pl. ii; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 432.

Nycticejus noveboracensis Leconte, Cuv. Regn. Anim. (McMurtrie's ed.), Appendix, 1831, 432; Temminck, Monog. Mam., II, 1835, 158. Wagner, Schreb. Säugeth., Suppl., I, 1840, 546; *Ib.*, V, 1855, 773. Schinz, Synopsis Mam., I, 1844, 199; Max. zu. Wied, Archiv Naturgesch., 1861, 186.

EXPLANATION OF PLATE XXVI.

FIG. 1. Front view of head of *Atalapha noveboracensis.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.
FIG. 8. Os petrosa. x 4.



ATALAPHA NOVEBORACENSIS.

Lasiurus noveboracensis Tomes, Proc. Zoöl. Soc. London, 1857, 34.

Vespertilio lasiurus Gmel. Linn. Syst. Nat., 1788; Schreb. Saug., 1826; Geoff. Annal. du Mus., Paris, VIII, 1806, 200, f. 6; Desm. Mamm., 1820, 142; Fisch., Synop. Mam., 1829, 109.

Nycticejus lasiurus Wagner, Schreb, Säugeth., Suppl., v., 1855, 772.

Vespertilio rubellus Palisot de Beauvois, Cat. Peale's Mus., 1796, 204.

Vespertilio villosissimus* Geoff., Annal. du Mus., Paris, VIII, 1806, 478; Desmarest. Mam., 1830, 143; Fischer Synop. Mamm., 1829, 110; Rengger, Säugeth. Parag., 1830, 83; Wagner, Schreb., Säugeth., Suppl. I, 1840, 536.

Vespertilio monachus Raf., Amer. Month. Mag., IV, 1817, 445.

Vespertilio tesselatus, *Ibid.*, Amer. Month. Mag. IV, 1817, 445.

Taphyzous rufus Harlan, Fauna Amer., 1825, 23.

Vespertilio rufus Warden, Descript. United States, v. 602.

Lasiurus rufus Gray, List. Mam. Brit. Mus., 1843, 32; Gosse, Naturalist in Jamaica, 1851, 280.

Vespertilio blossevillii Lesson et Garnot, Bull. des Sci. Nat., VIII, 95; Fisch. Synop. Mam., 1829, 110; La Sagra, Hist. de l'Ile de Cuba, 1840, 6, pl. i, f. 4, 5, 6, 7, 8.

Vespertilio bonariensis Lesson, Voy. de la Coquille, I, 1829, 137.

Nycticejus variis Poeppig, Reise Chili, I, 1835, 451; Wagner, Suppl. Schreb. Säugeth., I, 1840, 547; Gay, Hist. de Chili (Zoöl.), I, 1848, 37.

Atalapha Mexicana Saussure, Revue et Mag. de Zoöl., xiii, 1861, 97.

Atalapha varia Peters, MB. Akad. Berlin, 1870, 909.

Atalapha frantzii Peters, MB. Akad. Berlin, 1870, 908.

Atalapha pfeifferi Gundlach, MB. Akad. Berlin, 1861, 152.

Atalapha noveboracensis Peters, MB. Akad. Berlin, 1870, 908; Dobson, Cat. Chirop. Brit. Mus., 1878; Coues, Jordan's Man. N. A. Vert.; Alston, Biol. Central-Amer., 1879–1882, 22; Coues and Yarrow, Wheeler's Expedition, Zoöl., 1875. 1875.

New York Bat. Penn. Syn. Quad., 1771, 367. Encylcoped. Methodique. (Daubenton), 1783, fig.; Penn. Arct. Zoöl., 1792, 184; Kirtland, Zoöl. Report 18—, 175, Emmons, Mass. Report, 1840, 9.

Red Bat. Wilson Ornith., VI, 50, f. 4.

Diagnosis.—Much smaller than *A. cinerea*, which it otherwise closely resembles. The hair is reddish with fawn and chocolate variants. There is no clump of hair above the dorsal aspect of the elbow, and the forearm measures from 36^{mm} to 38^{mm}. The border of the auricle is brown and the external basal lobe is notched.

The phalanges in each digit, with the exception of the first, nearly the same length.

The manual formula is as follows:

	Millimeters.
First interspace	10
Second interspace	33
Difference	23
Forearm	37

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* The tragus in this species is described by its proposer as subulate. The hair extends on the dorsum of interfemoral membrane. But it is not mentioned to what degree. The membranes are pictose. The form is quite as likely to be a variety of *V. albescens* as one of *Atalapha*. (See p. 87.)

Description.—Ears shorter than head; less rounded than in *A. cinerea.*[*] While anterior border is convex the posterior is slightly concave between the tip and conch and minutely revolute. The internal basal lobe is wider than high, lower border horizontal, posterior end free and projecting back of the base of the keel (int. basal ridge). The keel is stout and conspicuous. The external basal ridge defined. A narrow hem confined to the region of the shallow notch which it entirely occupies. The external basal lobe rounded not incurved or thickened; a distinct notch at the base anteriorly. The tragus nearly half as high as the auricle. Anterior border nearly or quite straight, tip rounded and produced forward. The greatest width equals one-half the height. The basal lobe is conspicuous; above it lies a long shallow notch, the upper border of which forms a minute tubercle; above this the border is convex but tapers abruptly toward the apex. The tragus is marked by a transverse ridge, which, however, does not extend entirely across the outer surface.

The muzzle is flat or concave, and projects slightly beyond the lower lip. The nostril near the upper lip with septum touching the outer wall. The simple chin plate not bound to the gum nor defined at the sides, but continues with the border of the lower lip. It is apt to be more conspicuous in the female and have a sharply limited lower border.

The calcar is bony in adult forms. It often ends by a small distinct lobe. The post calcaneal lobe is often absent. The wing membrane is attached to the base of the toes. White spaces occupy the side of the fourth and fifth metacarpal bones. Numerous minute spots are dispersed over the third and fourth digital interspaces.

The fur is everywhere soft, luxuriant, and more brilliant in coloring than in any other species in the fauna. Above the general effect is of a russet red color with occasional shades of brown, fawn, dull buff, or gray. The hair of the body is everywhere black at the basil third, followed by a bright, broad band of light buff (gold or yellow); then follows a subtip of the characteristic hue of red or its variant, the extreme tip of the hair being often gray, especially toward the sides of the body. The hair is relatively short on the head and neck, and longer on the back of the chest, side of the neck, and over the loin. The ears are covered at the basal two-thirds with fine unicolored hair of the same hue as that of the head; thus the color of the back (at the ear) is brought around to the side and even to the front of the neck. The interfemoral membrane is completely covered in the majority of specimens with hair which is slightly woolly in texture and is without the black base and buff of the shaft that is so conspicuous in the hair of the body. The wing membrane is covered with hair from a point midway from the elbow to the ankle. Like that on the interfemoral membrane,

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[*] In the drawing of the head by M. Dugès, pl. XXVII fig. 2 the ears are represented as bordered by a broad dark margin. Nothing similar to this has been observed by me in the study of the alcoholic specimens.

EXPLANATION OF PLATE XXVII.

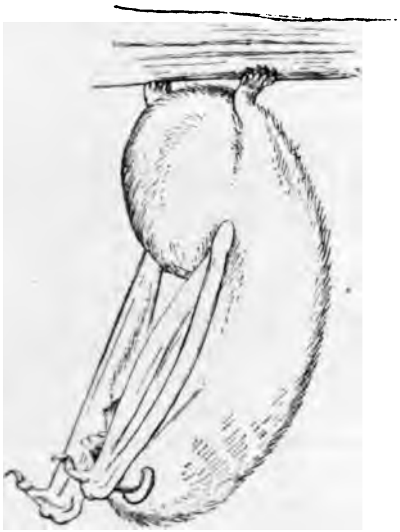
FIG. 1. *Atalapha noveboracensis* hanging by hind feet. The hairy interfemoral membrane is bent forward by the flexure of the tail. After a sketch from life by M. Dugés.

FIG. 2. Head of *Atalapha noveboracensis,* showing the protruding snout. After a sketch from life by M. Dugés.

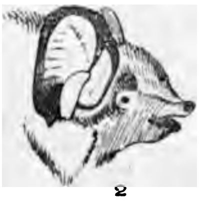
FIG. 3. Front view of head of *Atalapha teliotis.*

FIG. 4. Skull seen from above. x 2.

FIG. 5. Skull and lower jaw seen from the side. x 2.



1



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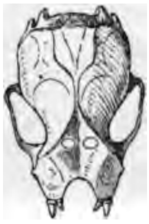

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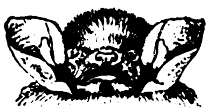

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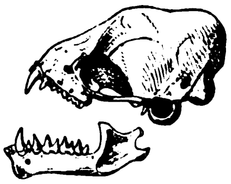

1, 2. ATALAPHA NOVEBORACENSIS. 3, 4, 5. ATALAPHA TELIOTIS.

the basal black is here absent. The back of the foot is covered with hair of the same character as on the interfemoral membrane. A patch of white hair is seen overlying the first metacarpal bone.

The abrupt contrast seen at the side of the neck between the dorsal and the ventral colors, the long stretch of the dorsal color that covers the ear and extends with its lower forward curve to near the angle of the mouth, the raised longitudinal fold of integument, tend to make this part of the body of special interest.

On the venter the hair is not of the uniform shade of the dorsum, but presents two divisions, the first in the region of the space beneath the jaws and in front of the neck; the second, that of the front of the chest, the abdomen, and the pubis. The first is of a delicate shade of russet red, verging to yellow; the second is of a grayer or whiter tinge, especially at the tips of the hair. The sides are often pure salmon. The basal black and shaft of buff are the same as on the dorsum, but the long gray tip is best developed on the venter. The salmon-tinted hairs of the side are without yellow on the shafts and are often without gray tips. A conspicuous white patch is seen on the venter of prebrachium as this membrane joins the body. In some individuals a ring like band of white is continuous with these patches across the pectoral region. The sides of the neck are particularly richly colored for the red and white effects are here abruptly demarcated. In Southern examples the gray of the abdomen predominates over the red and salmon. In Mexican varieties the entire venter assumes a gray tinge with warm sienna brown interspersed. The hair of the membranes is less developed on the interfemoral membrane, but is more developed on the wing membrane than is the case on the dorsum. On the interfemoral membrane short, woolly, sparsely arranged unicolored fur is seen at the basal half only. From the knee the same character of fur extends to the third digit from the side of the body for a distance equal to one-third of the width of the wing. The color is dull salmon.

The varieties of coloration are found in the subtip and tip of the hair; they may be named the red, the dark brown, and the gray. The red is confined to the subtip and is accompanied with a bright buff shaft and no ashy tip or so slight a disposition to ash as not to interfere with the prevalent color. The dark brown retains a dull old gold or ocher shaft, with a subtip of this color or of old gold; in this variety the membranes are from dark brown to nearly black; the gray color, to a gray-brown subtip, a fawn shaft, and a long gray tip; no ashy hue is anywhere seen.

These differences do not correlate with any structural peculiarities or with contrasts in measurements. Unfortunately many of the more striking are from examples which are without locality. One gray specimen was from Louisiana. In a specimen from Mount Pleasant, sent me for inspection by Mr. G. S. Miller, jr., the colors were somber, being of a dull maroon mottled with black, remarkably like the display of colors in *A. semota*, from the Sandwich Islands.

In the immature individual the hair is without the basal black. On the dorsum the tips are more ashy than in the adult. In some specimens the gray tints predominate along the entire hair. In other examples the basal parts are light brown or reddish brown. On the venter the parts below the line of the head are entirely white over the chest in very young animals, the abdomen being naked. In older forms the basal parts are brown; the sides of the trunk are lined nearly as far back as the spine, much as in *Chilionycteis davyi.* The ears are hairy with the exception of the tips. The deep conch, as it turns on the neck, is heavily covered with hair of the dorsal hues. The hair on the interfemoral membrane and the white spots on the first and fifth metacarpals are as in the adult, but the hair along the forearm is absent.

In an embryo 26^{mm} long, from vertex to pubis was, with the exception of a little hair on the lower lip, naked on the under surface of the body. The color of the skin was of a delicate salmon. On the back, including the interfemoral membrane, the hair was short, uniform, and of a chestnut-brown color, with ashy tips, excepting the margin of the trunk, where the hair was white. On the head a fold extended obliquely forward and inward and almost joined a corresponding band from the ear of the opposite side. The skin of the side of the neck over the position of the tendon of the occipito-pollical muscle was conspicuously raised. In another example of the same size the coloration was the same, excepting that the junction of the side of the neck and the region of the shoulder (ventral aspect) was covered with short, white hair.

Variations.— No. 9050 U. S. N. M.; skin, nearly adult; without locality, is of a uniform gray at the subtip. The absence of the characteristic russet and chocolate tints easily distinguishes this form. It probably is from a northern locality. The specimen is in bad condition. Specimen No. 11153 U. S. N. M., skin, from Arizona or Nevada, Wheeler's expedition (?), does not appear to differ from the eastern examples. The Mexican and California varieties are smaller, with a redder color posteriorly and a gray hue anteriorly. The shoulder tuft is more distinctly ventral. The ventral aspect of the interfemoral membrane is less hairy at the base than are the northern forms, while the hair about the interior extremity extends farther on the endopatagium.

An example from Guanajuato, Mexico, in the collection of Mr. H. A. Ward (No. 14296), resembles *A. frantzii*, Peters. The venter is covered with silky fur, plumbeous at basal half, and whitish or gray at apical half. The fur on the membrane is grayish.

Two examples from Florida, in the Museum of Comparative Zoölogy, are darker throughout than the above description. The external basal lobe was larger, the first phalanx of the second shorter, finger and the external border of the auricle slightly emarginate. The specimens are immature and much mutilated with shot. They may represent *A. pfeifferi* (?). Mr. C. F. Maynard, *l. c.*, mentions that specimens from

Florida ara not only smaller in size than those from the North, but are much deeper in color; the fur is generally tipped with ash.

The extent to which hair is distributed over the skin expanse is subject to considerable variation. It is scantily present over the dorsum of the interfemoral membrane and the ventral region of the forearm in all the specimens (three in number) which have been collected in California. In this particular such specimens resemble the parts as found in *D. ega*, Gervais and *D. egregia*, Peters. It is possible that the Mexican *A. frantzii* may range northward as far as California. In specimen No. 1421 from Massachusetts, in the Museum of Comparative Zoölogy, the hair is restricted in almost precisely the same manner as in the western and neotropical varieties. It is interesting to notice the persistence of the minute tufts of hair on the first and fifth metacarpal elements. These appear early in the individual, while the other growths appear late, and hence subject to a greater range of variation. The size of the post-calcaneal lobule varies, and in some specimens it is absent. Dobson states that it is always absent. The prebrachial membrane is as a rule ample, but it may end on the radius at a point at the beginning of the distal fourth of the radius. When the membrane is scant the auricle is thick and well set. It is suggestive that in the Molossi when the auricle is thick and leathery the antibrachial membrane is also small.

It is evident from the above account that extended series from the entire continent will be necessary before the observer can determine the validity of species which have been described from Mexico and South America. From the material at my disposal I prefer to accept but two red bats in the United States, *A. noveboracensis* and *A. teliotis*, though holding as probable that a distinct species may be discovered in Florida. The figure drawn by M. Dugès (Pl. XXVII, fig, 2) exhibits the auricle bordered by a broad margin of a contrasting shade to that of the interior, as in *A. cinerea* and the tragus not incurved. It is probable that the fur conceals the external basal lobe, as here represented.

Maj. Le Conte mentions having met with an entirely white form, the bases of the hair alone being dark. It was probably an albino.

In a specimen from Cambridge, Mass., in the collection from Mr. G. S. Miller, jr., the internal basil lobe ends abruptly at the outer end of the internal basil ridge, and is sparsely covered with hair on the conchal surface.

So acute an observer as Mr. J. A. Allen believed, in 1869 (Bull. Mus. Comp. Zoöl., 1869, 143), that the red and hoary bat may yet prove to be one and the same species. In this opinion I can not concur.

Membranes.—The membranes are attached almost to the back of the trunk. The prebrachium forms a ridge at the side of the neck over the occipito-pollical muscle. The thumb is disposed to be drawn palmad by the trachim of this muscle, but to a much less degree than in species of Phyllostomidæ. The thumb callosity is not wider than the adjacent phalanx. The membrane is drawn evenly across the dorsal borders of the digit, so that the bones project palmad only. The third metacarpal bone is here as distinct as any others of its series. The proximal fourth of the fifth metacarpal bone is concealed by palmar folds.

When the lines of the membranes are studied they are seen to be much the same as in *A. cinerea*, with the exception of the intercostal lines, which are more distinct than in that species, and the horizontal limbs of the triceps fascicle system are farther apart. The third interspace is without predigital lines. The terminal digit of the fourth finger is without projecting lobe; that of the fifth finger is minute. The prebrachim with two elliptical thickenings in the line of the tendon of the occipito-pollical muscle; one of these lies at the shoulder, the other along the line of the forearm.

Skull.—The brain case is much elevated posteriorly and abruptly inclines downward toward the face; no depression on vertex between mesencephalon and metencephalon. Processes and crests as a rule produced. The sagittal temporal crest is short and nearly confined to the interval between the metencephalon and the mesencephalon. The posterior temporal ridge is well defined and extends obliquely from the end of the sagittal, thus leaving a large triangle between the two crests and the occipital crest. The anterior temporal crests are faintly defined. The metencephalon is a third of the entire length of the head. The swelling of the protencephalon is distinctly seen on the vertex. The vertex of the face is provided with a wide groove its entire length; there is no nasal eminence. A rounded ridge is seen on each side on the line of the single incisor. The outer wall of the infra-orbital canal is elevated into a tubercle. The lachrymal bone bears a distinct though small spine. The fronto-maxillary inflation is moderate and the inner wall of the orbit flat. The zygmotic arch is slender and of uniform width, *i.e.*, is without elevation of the upper border. The paroccipital process is nearly as long as the occipital condyle; the mastoid process is nearly as long as the paroccipital; the lower border of the interval is deeply notched. The tympanic ring is complete. The angle of the lower jaw is entirely outside the condyle, as seen from above. The masseter impression is not defined inferiorly and reaches the inferior impression of the horizontal ramus.

The details of the cribriform plate and the ethmoidal turbinal plates are as follows:

The encranial surface presents the septoturbinal foramina placed in a row along the anterior half of the space of the same name. The openings of the ectoturbinal surface are in a direct line with the foregoing, and both are depressed below the general surface. The foramen for the first endoturbinal is seen lying at the bottom of the conspicuous depression near the crista galli. The foramina are everywhere at sides of the encranial surface. Seen from the nasal aspect the binal seems to be nearly the length of the first endoturbinal, a pressed medio-laterally. It is slightly convolute outward at its base and concave on its lateral surface. The first endoturbinal is abruptly acuminate anteriorly, and straight on its median, lateral, and under free surfaces, the last named being concave inferiorly. The second endoturbinal plate is oblique, and slightly inflated at its anterior end. Its lower border forms the inferior edge of the median series of plates. The third endoturbinal is triangular in shape, and is one-half the size of the preceding.

Teeth.—Teeth the same as in *A. cinerea*, with the exception the lower incisors are less crowded and serrate throughout. Some specimens show a degree of crowding greater than that exhibited in the drawing. The anterior prolongation on the lingual aspect of the lower second premolar is somewhat exaggerated. The incision between the paraconid and hypoconid does not reach to the level of the basal cingula.[*]

The milk upper incisors are carried outward, canine form, and four in number. The lower incisors are unequal, the first tooth being the smallest and simplest, the third the largest and most complex. The lower canine is curved backward and furnished with a large basal cusp.

Mr. G. S. Miller has sent me, from Nassau, a skull of *A. noveboracensis* possessing the remarkable peculiarity of the left maxillary incisor having two distinct cusps instead of one. Close examination was required before it could be seen that two left incisors were not present.

Notes on the skeleton.—The end of the coracoid process of the scapula is scarcely wider than the base; the spine is but little curved and is furnished with a tubercle at the middle. The region of the semicircular canals of the bony labrynth is scarcely wider than the cochlea, and is without lateral expansion. The epicondyle of the humerus is produced as a spine. The sternum is provided with a large ventral crest at the anterior third of the prosternum; the lateral process is one-half the length of this segment. The distal rudiment of the ulna is in the form of a reverted spine, which is occasionally united to a crest projecting from the radius, thus converting the notch that is defined between the ulna and the radius into a foramen. The radius is quadrate, in transverse sections; it retains a groove for the extensor tendons. The pectineal spine is quadrate and as high as the upper border of the acetabulum. The calcar is firmly osseous. The fourth metacarpal bone is not concealed when the third and fifth bones are approximated; the first metacarpal bone lies near the center of the carpal region; the second metacarpal is broad and stout, resulting in defining a small second space between it and the second metacarpal.

Remarks on sex.—The females as a rule are a little larger than the males, and, when fully adult, retain at the lower border of the chinplate a sharper border, which extends slightly along the lip; the tongue and the terminal caudal vertebra are also somewhat longer. It is probably true that these characters are tactile in significance and relate to the delivery and care of the young. From the marked flexibility of the tail the interfemoral membrane is brought well to the front. The head can with ease be depressed into the pocket in this way formed, and the mother can easily guide the young with her mobile lips to the mammary glands. While this conclusion is of the nature of a surmise, it is made tenable by the structure of the parts involved in the act.

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[*] Maj. John Leconte (Proc. Acad. Nat. Sci. Phila., 1853), in describing the teeth of this species, states that the canine is hollowed out behind, with a perpendicular septum dividing the concavity for its whole length. The premolars are concave on the outer and inner surfaces.

The prepuce is thick, cauliflower-like.

The females are more often preserved in the museums than the males; whether this is due to the greater abundance of females or for some peculiarities which render their capture more easy, is impossible to say.

The mammary glands are rudimental in the female between periods of sexual activity. The mammary region is covered with fur of the same character as seen elsewhere on the front of the thorax. Neither in a female, which possessed embryos two lines in length, is there any external development. If such a specimen be dissected the locality of a mere trace of the gland can be detected by the position of a small circular spot of dark skin, which retains a central white point. No mammary structure will be visible. The lactating female, however, possesses large mammæ; one of these lies on the border of the axilla and a second over the pectoral muscle.

The testicles are black. The prepuce is thick and cauliflower-like.

Habitat.—The red bat has an extensive range, even assuming that the species of the tropical and neotropical regions are distinct. According to J. B. Tyrrell (Cat. of Mam. of Canada, Toronto, 1888) it is found throughout Canada, from the Atlantic to the Pacific coasts. In the United States it appears to be more common in the valley of the Mississippi and in the Atlantic slope than on the western plateau. According to C. Hart Merriam (*l. c.*) it is rare in the Adirondack Mountains. To the west of the Sierras it is not common. But two specimens were sent me from the local collection of the California Academy of Science. In the Museum of the Smithsonian Institution in 1865 there was but a single specimen from this region. This was secured at Fort Tejon.

C. F. Maynard, in his paper entitled "Mammalia of Florida" (*l. c.*), says that this species is common in the more northern sections of the State, frequenting the woods. During the day the bats are seen clinging head downward from the leaves of trees. The animal has been captured in the eastern United States while hanging in the manner described. These observations harmonize with the rudimental metacarpo-phalangeal callosity of the first digit and the great l
third digit, which can not in repose be dorsiflexed at
Nevertheless specimens have been obtained from

N. Y., by G. J. Green, and the collection of the Museum of Comparative Zoölogy contains a specimen (No. 5991) which was secured in Short Cave, Kentucky.

J. G. Shute, of Woburn, Mass., observed soon after sunset in October a strange object pass him in the air which seemed to fall to the ground not far from where he was standing. He found it to be a pair of red bats *in coitu*. (J. A. Allen, Bull. Mus. Comp. Zoöl., 1869.)

From the drawing by M. Dugès (Pl. XXVII, fig. 1), which was sent by him to Prof. Baird, it can be inferred that the animal while at rest may bring the interfemoral membrane forward and upward over the abdomen. I have elsewhere ventured to suggest that the female may insert the head into the pouch in this way formed to assist in the delivery of her young and to care for them afterwards. In a second drawing the snout (see Pl. XXVII, fig. 2) is represented as protruding. It is noticeable that the mouth is not wide open and that no teeth are visible.

The red bat may fly over wide ranges of open water, since a specimen now in the Museum of Comparative Zoölogy was caught at sea near Cashes Ledge. The disposition for bats to fly over the water has been often noted; they not only collect the dipterous and neuropterous insects which there abound, but when at rest hang from a branch or twig on the edge of a bank with their snouts nearly touching the water. (Merriam.)

The following table includes measurements of very young individuals with deciduous teeth:

	725 M. C. Z.	No number. U. S. N. M.	No number. U. S. N. M.
Head	11	14	15
Body	15	25	28
Forearm	10	19	28½
First metacarpal bone — first digit	2½	3	3
Phalanx	4	5	6
Tibia	7	10	12
Foot	7	7½	7

In these three individuals, whose forearms are, respectively, 10, 19, and 28½, the foot remains essentially unchanged, and is the same in the smallest specimen as in the adult. In the first of the series the tibia and foot are of the same length. The bone grows rapidly, and is over twice the length of the foot in the adult. The body and the forearm grow in about the same ratio, and change much more rapidly than does the head.

Measurements.

	mm.	mm.
Head and body (from crown of head to base of tail)	.....	.....
Length of arm	23	.....
Length of forearm	38	35
First digit:		
Length of first metacarpal bone	2	3–4
Length of first phalanx	5	5
Length of second phalanx	2	2
Second digit:		
Length of second metacarpal bone	39	35
Length of first phalanx	8	.....
Third digit:		
Length of third metacarpal bone	40	39
Length of first phalanx	17	17
Length of second phalanx	17	16½
Fourth digit:		
Length of fourth metacarpal bone	37	39
Length of first phalanx	12	11½
Length of second phalanx	10	8
Fifth digit:		
Length of fifth metacarpal bone	36	32½
Length of first phalanx	6	7
Length of second phalanx	9	4½
Length of head	17	.....
Height of ear from head	6	.....
Height of tragus	.....	.....
Length of thigh	19	16
Length of tibia	17	15
Length of foot	7	.....
Length of tail	36	.....

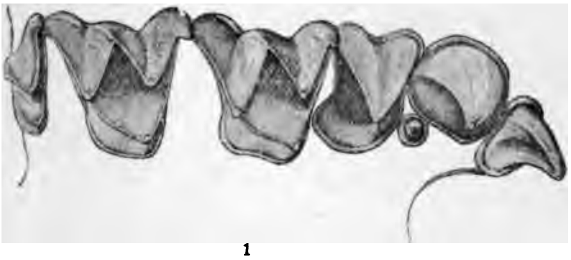
* Lactating.

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of fore-arm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*
5266	1.9	2.0	1.6	0.9	3.3	0.4½	0.4	0.2	10.9
5267	1.9	2.0	1.6	0.9	3.5	0.4½	0.6	0.3	12.0
67	2.0	1.9	1.6	0.9	3.0	0.4	0.5	0.3	11.6
.....	2.0	1.9	1.6	0.9	3.5	0.4½	0.4	0.3	12.0
.....	2.0	1.9	1.5	0.9	2.9	0.4	0.5	0.3	11.0
.....	2.0	1.9	1.6	0.9	3.0	0.4½	0.4	0.3	11.0

List of specimens.

Cat. No.	Speci-mens.	Locality.	Presented by—	Nature of specimen.	Collection.
5242	1	Muskeeget Island, Mass	Dr. T. M. Brewer	In alcohol.	U. S. N. M.
5243	2	Wethersfield, Conn	Charles Wright	...do	Do.
5245	2	Mount Holly, N. J	Dr. Brown	...do	Do.
6188–90	3	Carlisle, Pa	S. F. Baird	...do	Do.
5244	17	...do	...do	...do	Do.
5540	2	Ann Arundel County, Md	J. H. Clark	...do	Do.
5247–8	2	Washington, D. C	National Institute	...do	Do.
5246	1	...do	Dr. Nichols	...do	Do.
5257	3	Columbus, Ga	Dr. Gesner	...do	Do.
5256	5	Liberty County, Ga	Dr. W. L. Jones	...do	Do.
5263	1	Tallahassee, Fla	T. Glover	...do	Do.
5314	1	Micanopy, Fla	Dr. J. B. Bean	...do	Do.
5260	2	Eutaw, Ala	Prof. Winchell	...do	Do.
5259	1	Washington, Miss	Col. B. L. C. Wailes	...do	Do.
5252	1	...do	...do	...do	Do.
5253	1	Monticello, Miss	Miss H. Tennison	...do	Do.
5464	1	Columbus, Miss	Dr. Spillman	Dry skin	Do.
5261	2	Tyree Springs, Tenn	Prof. R. Owen	In alcohol	Do.
5262	2	Knoxville, Tenn	Prof. Mitchell	...do	Do.
5274	1	Grand Coteau, La	St. Charles College, U.S.A.	...do	Do.
5270	1	Prairie Mer Rouge, La	James Fairie	...do	Do.
5253	1	Fort Towson, Ark	Dr. L. A. Edwards	...do	Do.
5254	2	Fort Smith, Ark	Dr. G. C. Shumard	...do	Do.
5256	3	Red River, Ark?	(?)	...do	Do.



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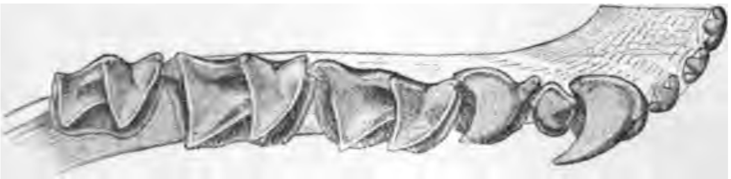

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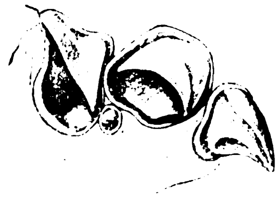


3

1. MAXILLARY TEETH OF ATALAPHA NOVEBORACENSIS. X 16.
2. MANDIBULAR TEETH OF SAME. X 16
3. MAXILLARY INCISOR, CANINE, AND PREMOLARS OF ATALAPHA TELIOTIS. X 16.

List of specimens—Continued.

Cat. No.	Specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5251	1	Cass County, Mo	Dr. P. R. Hoy	In alcohol	U. S. N. M.
5463	1	Missouri	do	Dry skin	Do.
5250	14	St. Louis, Mo	Dr. G. Engelmann	In alcohol	Do.
4215	1	Neosho Falls, Kans	B. F. Goss	Dry skin	Do.
5249	6	Illinois	R. Kennicott	do	Do.
5460	1	Cook County, Ill	do	do	Do.
5457	1	Racine, Wis	Dr. P. R. Hoy	do	Do.
5459	1	Albion, Mich	R. R. Child	do	Do.
5456	1	Grosse Isle, Mich	Rev. Charles Fox	do	Do.
5466	1	Lake Superior	(?)	do	Do.
5458	1	Yellowstone River	Dr. F. V. Hayden	do	Do.
5461	1	do	Col. Vaughan	In alcohol	Do.
5265	1	Nebraska	Dr. J. G. Cooper	do	Do.
5264	1	Laramie Peak, Nebr	Dr. Hayden	do	Do.
5278	1	Cimarron River, Kans	J. H. Clark	do	Do.
5269	1	Pecos River, Tex	Capt. J. Pope	do	Do.
5272	3	Bet. Laredo & Camargo, Tex.	Arthur Schott	do	Do.
5277	5	Matamoras	Lieut. Couch (Berl. Col.)	do	Do.
5268	1	Fort Bliss, N. Mex	Lieut. S. W. Crawford	do	Do.
5266	1	Fort Tejon, Cal	John Xantus	do	Do.
5267	1	Cape St. Lucas	do	do	Do.
5273	1	Rock Creek?	W. S. Wood	do	Do.
5279	1	Locality unknown	(?)	do	Do.
5275	1	do	(?)	do	Do.
6185–7	3	do	(?)	do	Do.
5271	1	do	(?)	do	Do.
5541	1	do	W. L. Le Duc	do	Do.

2. **Atalapha teliotis** H. Allen. (Plates XXVII, XXVIII.)

A. teliotis H. Allen, Proc. Amer. Phil. Soc., XXIX, 1891.

Ears rounded, much smaller than head. The internal basal lobe longer than broad, and without posterior projection. The external basal lobe longer than high, without notch at the base anteriorly. The hem occupying notch is half the height of the auricle and is ample. The tragus is coarsely crenulate on the outer border, slightly narrowed at the tip, which is not turned forward. The external surface is without a trace of ridge, and the notch at the base above the small basal lobe without a tubercle. Snout and lower lip quite as in other species of the genus, except that the chin plate is somewhat wider.

Skull with groove on center of face vertex continuous with the anterior nasal aperture. Sagittal temporal ridge sinuate. The first upper premolar exceedingly minute, scarcely half the size of the corresponding tooth in other species; it can with difficulty be seen even with the aid of a lens. The lower premolars are nearer of a size than is the case in other species, the first being fully half the size of the second. The third lower incisor is rounded, minute, and without cuspules.

The membranes are much as in *A. noveboracensis*, but the terminal phalanx of the fifth finger is longer and ends with a free end on the margin of the endopatagium. The membranes are attached to the foot at a point midway between ankle and the base of the toes.

The prevalent color of the hair is dark chestnut above, but lighter below. The base on the body is everywhere black, and the shafts buff. No ashy tips are anywhere seen. The ventral half of the side of neck is white. The hair is scanty along the ventral surface of the forearm and the proximal ends of the last three metacarpals. The dorsum of the interfemoral membrane is furred only at the basal third. The remaining characters as in *A. noveboracensis*.

The manal formula is 2–10–28–37, the difference between the third and fourth interdigital interspace 18, and is much the same as in *A. noveboracensis*.

Teeth.—The teeth, as in other species of the genus, with the exception that the first premolar is smaller and slightly oval, and the second premolar with a narrower V and smaller heel.

This species is readily distinguished by the shape and small size of the ear and tragus, by the attachment of the wing membrane to the foot, and by the peculiarities of the premolars in both jaws, as well as those of the third lower incisors. It agrees with a southern variety of *A. noveboracensis* (*A. frantii*) in the partially free dorsal surface of the interfemoral membrane.

The specimen was forwarded to me by Mr. J. G. Cooper, of the California Academy of Natural Science, in a bottle containing an example of *A. noveboracensis*, and it resembles this form so closely in coloration that at first I mistook it for an immature example of the species last named. The specimen is in poor condition. After decomposition had set in it had been preserved for a long time in strong alcohol.

Habitat.—Unknown, but is probably southern California.

Measurements.

	Millimeters.
Head and body (from crown of head to base of tail)	38
Length of arm	22
Length of forearm	37
First digit:	
Length of first metacarpal bone	2
Length of first phalanx	4
Second digit:	
Length of second metacarpal bone	40
Length of first phalanx	6
Third digit:	
Length of third metacarpal bone	40
Length of first phalanx	14
Length of second phalanx	15
Fourth digit:	
Length of fourth metacarpal bone	38
Length of first phalanx	10
Length of second phalanx	8
Fifth digit:	
Length of fifth metacarpal bone	32
Length of first phalanx	7
Length of second phalanx	7
Length of head	12
Height of ear from head	4
Height of ear from base of external lobe to tip	6

Measurements—Continued.

	Millimeters.
Height of tragus	3
Length of thigh	14
Length of leg	16
Length of foot	6
Length of tail	39
Width of second interdigital interspace	2
Width of third interdigital interspace	10
Width of fourth interdigital interspace	28
Difference between third and fourth interspace	18
Length of forearm	37

The measurement of the body and of the metacarpals are within the range of these which can be made on specimens of *A. noveboracensis.* The second phalanx of the third finger is longer than the second; the second phalanx of the fourth finger is much shorter than the first; the second phalanx of the fifth finger is of the same length as the first. In these respects the measurements are in contrast with those of *A. noveboracensis.* The thigh is shorter than the leg, while both are smaller than is the species named. The foot is shorter, while the tail is slightly longer.

1. **Atalapha cinerea** (Palisot de Beauvois). The Hoary Bat. (Plates XXIX, XXX, XXXI.)

Vespertilio cinereus Palisot de Beauvois, Cat. Peale's Mus., Phila., 1796, 14; Leconte, Proc. Acad. Nat. Sci. Phila., 1855, 433.

Vespertilio pruinosus Say, Long's Exped. to Rocky. Mts., 1823, 67; Harlan, Fauna Amer., 1825, 21; *Ib.*, Med. and Phys. Researches, 1831, 28; Godman, Amer. Nat. Hist., 1826, 68, pl. II, f. 3; Richardson, Fauna Boreal. Amer., 1829, 1; Cooper, Ann. Lyc. Nat. Hist. N. Y., IV, 1837, 54; DeKay, Nat. Hist. N. Y. (Zoöl.), 1842, 7, pl. II, f. 2.

Scotophilus pruinosus Gray, Mag. Zoöl. and Bot., II, 1838, 498.

Nycticejus pruinosus Temminck, Monog. Mam., 1835, 151; Wagner's Schreb. Säug. (Suppl.), I, 1840, 544; *Ib.* V, 1855, 770; Schinz, Syn. Mam., I, 1845, 197; Max. Zu, Wied, Archiv Naturgesch., 1861, 185.

Lasiurus pruinosus Tomes, Proc. Zoöl. Soc. Lond., 1857, 37.

Lasiurus cinereus H. Allen, Monog. N. A. Bats, 1864, 21; J. A. Allen, Mammals of Mass., 1869, 208.

Atalapha cinerea Peters, MB. Akad. Berlin, 1870, 910—Dobson, Cat. Chirop. Brit. Mus., 1878, 272—Alston, Biol. Centrali-Amer., 1879-'82, 23.

Diagnosis.—A large bat with rounded black-bordered ears, blunt incurved tragus; external basal lobe without notch; interfemoral membrane hairy above. Color distinctive, being hairy with play of colors of grays and of dull yellow. A clump of hair above the dorsal aspect of elbow. Forearm 54$^{\mathrm{mm}}$.

The second phalanx in each digit shorter than the first.

The manal formula is as follows:

	eters.
Third interspace	13½
Fourth interspace	40
Forearm	49
Differences between third and fourth	27

Description.—The auricle is erect, of a subrounded form, and in good specimens marked within by four delicate transverse lines; when pressed on the head the upper border reaches to the median line or extends slightly beyond it. The outer border of the auricle is slightly emarginate and with the exception of the border, is of the color of the wing membranes. The border, as just mentioned, is of a darker hue than the rest of the auricle and is naked, except along the posterior border, where it is furnished with a single row of hairs. The remainder of the auricle is hairy. The internal basal lobe is large and reaches to or conceals the eye; it is as broad as the tragus at its widest part. The lower border is oblique from behind forward. The external basal lobe is also large, not revolute, separated from the main body of the auricle by a deep incisure, in which is lodged the basal lobe of the tragus, but not produced at the anterior border to the extent seen in *A. noveboracensis.* When pressed against the side of the head the upper border touches the internal basal lobe.

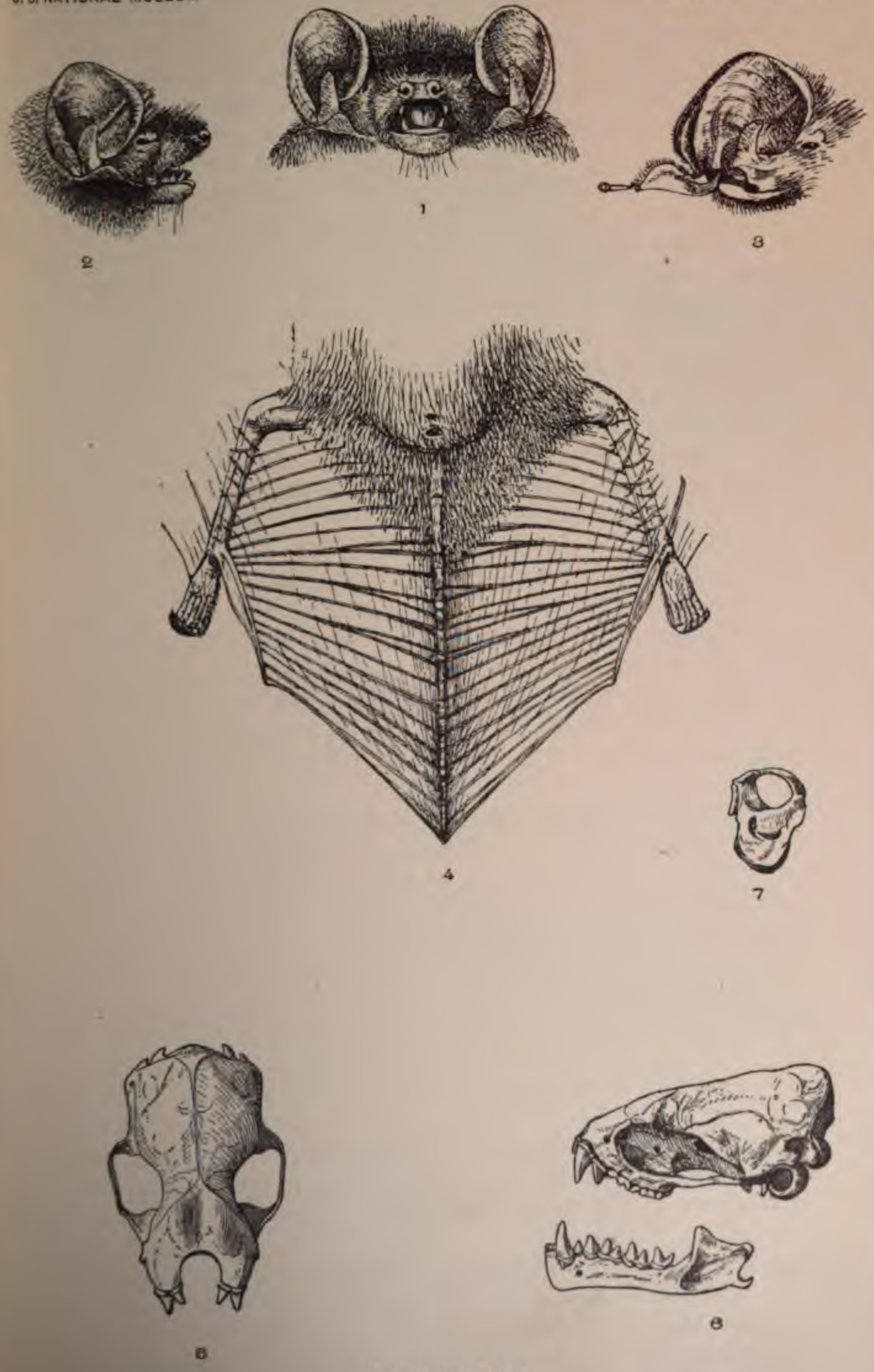
The tragus with basal lobe to the outer side of pedicle, which is separated by a deep rounded notch from the main lobe. This notch receives the revoluted border within and below the notch in the auricle. At the widest part the tragus is more than half its height.

The mouth cleft reaches to the second line of the premolar or to the external canthus. The lower lip is fleshy and not fixed to the gum. Two subrounded, subequal buccal folds are present. A wart is found at the angle of the mouth, and a second back of the chin. The snout is broad, nearly equally in width the length of the mouth cleft, as seen in profile. When the fleshy upper lip is drawn outward the distance between the incisor teeth and the end of the snout is equal to the width of the snout. The nostrils are slightly produced, directed obliquely outward, the space between them concave. The surface is marked by a transverse line of supralabial hairs as in Molossus. The rounded shield between the upper incisors separated from the upper lip by a depression.

Coloration.—The plan of coloration is the same as in *A. noveboracensis.* On the dorsum of the head and on the ears the hair is light brown to dull yellow, with black base. On the dorsum of the neck and chest the color on the shaft above the basal black is of a dull yellow, to ocher instead of bright yellow; the subtip is deep brown, chocolate, umber, or even black, against which the ashy tip appears to good advantage. The last two colors are conspicuous in the unmanipulated fur, and has caused the name "hoary bat" to be given the species. On the loin the shades are darker than elsewhere. On the venter the hair of the side of the face and beneath the jaws is black. The upper half of the neck is dull yellow, with black base; the lower half of the neck is provided with a deep brown subtip, with slight ashy tip; which character of fur extends over the chest and abdomen. As in *A. noveboracensis*, the line between the neck and the chest is marked by a ring-like disposition of

EXPLANATION OF PLATE XXIX.

FIG. 1. Front view of head of *Atalapha cinerea.*
FIG. 2. Side view of head of same.
FIG. 3. Side view of tragus and inner surface of auricle
FIG. 4. Tail and interfemoral membrane.
FIG. 5. Skull seen from above. x 2.
FIG. 6. Skull and lower jaw seen from the side. x 2.
FIG. 7. Os petrosa. x 4.



ATALAPHA CINEREA.

white tips, which become conspicuous on the ventral aspect of the prebrachium to form the so-called "shoulder tuft." At the pubis, the base of the interfemoral membrane, and along the sides of the trunk, including the axillæ, the hair is silky and without the black base; it is dull brown or cinerous, with a long, ocher tip.

The membranes.—On the dorsum the hair extends from the body as far as a line from the middle of the humerus to the ankle, and thus extends slightly on the membrane beyond the tibia. A distinct patch covers the back of the first metacarpal, the first interdigital space, and the base of the second metacarpal bone; a mere fleck overlies the base of the fifth metacarpal and the forearm near the elbow. On the venter the membranes are covered with short, brown, obscurely bicolored fur from the side of the body, and thence extends in a broad, oblique line as far as the third digit; upon the third interspace it stretches distally for a distance equally one-half the length of the metacarpal bones. The arm is covered, while the forearm is naked. The prebrachium is also furred, save at the free border. The exterior of the auricle is covered with dull yellow or ocher-colored hair, except at the broad, black margin, which, however, bears at the lower part a delicate fringe. The interior of the auricle, both in front and back of the keel, is covered with short hair. The tragus is also slightly furry. The dorsum of the interfemoral membrane is covered throughout with hair of the same character as that of the loin, or with that in which the shaft assumes a darker shade of buff [illegible] brown; the ventral aspect of this membrane is furred only at the b[illegible]d; the color can not be distinguished from that of the pubis.

[illegible]*iations.*—In [illegible] U. S. N. M., Utah, the hair *on the loin and* [illegible]f the int[illegible] membrane is of [illegible] *café au lait brown instead* [illegible]ker sh[illegible] d in the te[illegible] 4223, [illegible] Petaluma, [illegible] *No. 13207, also from* [illegible], the [illegible] hair abov[illegible] *dark shade is almost* [illegible] h on [illegible] ead and [illegible] *ventral aspect of the* [illegible] face ar[illegible] *of black.* [illegible] British [illegible] the venter [illegible] the neck than [illegible] length from 1[illegible] the proximal half [illegible] larger [illegible] above [illegible] U. S. N. M. [illegible] The [illegible]

The triceps fascicle system crosses the elbow at origin, is without vertical branch, but yields two horizontal primal branches; these extend across the membrane near each other and appear to end in the abruptly determined comb-like endings which do not reach the region of the phalanges of the fifth finger. There are two oblique lines extending downward and somad from the muscle-mass at distal end of the fifth finger.

The fourth interspace has the predigital nerve, as in *Miniopteris*, while the terminal branches do not reach the digits of the fifth finger, but join a branching nerve which appears from the metacarpo-phalangeal joint of the fourth finger. A small unbranched line (postdigital nerve?) appears at the middle of the fourth metacarpal bone.

Two oblique bands are seen on the fourth interspace near the palm. A fork-like arrangement of lines is seen in the angle between fourth and fifth metacarpal bones, and appears to be a branch of the median dividing into the two branches commonly seen in this interspace. In the third interspace a similar arrangement is seen, but the main nerve pursues a longer course before dividing. At the region of the digits there are two predigital nerves and three postdigitals. In this portion of the membrane, therefore, an unusually large number of lines are seen. It is possible some of these lines pertain to the blood-vessel system.

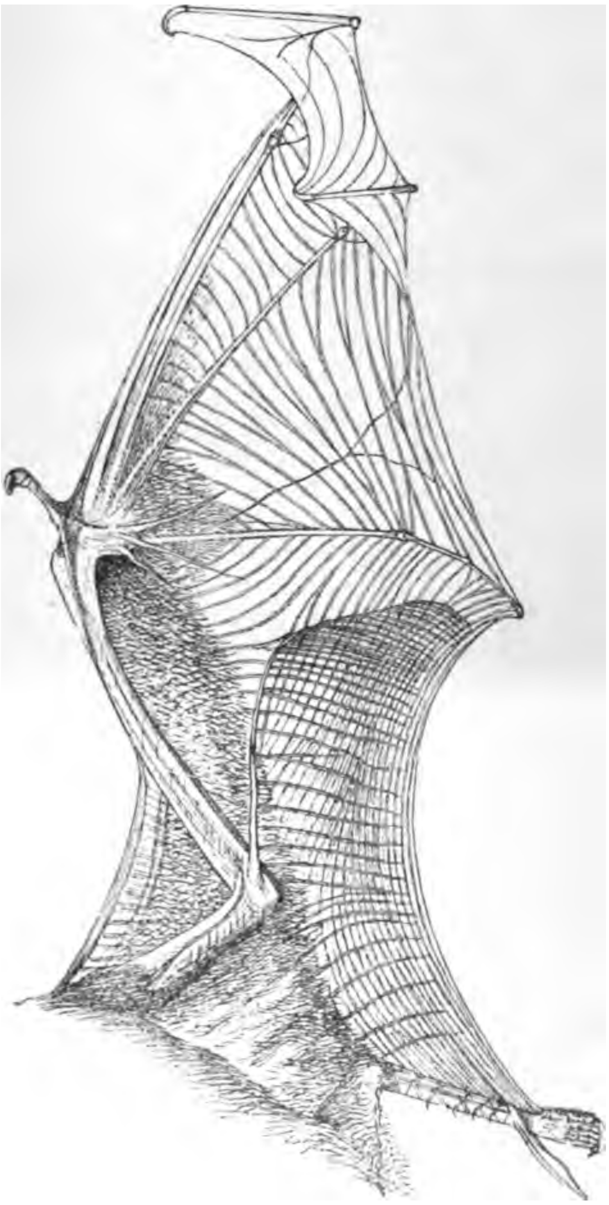
The pelvotibial line is seen on the interfemoral membrane; but the oblique lines from the caudal vertebræ are distinctly visible.

The terminal phalanx of the third finger is curved only at the tip, and no part thereof projects; that of the fourth finger is acicular, deflected at a right-angle pollical to the second; it yields a free projecting tip; that of the fifth finger is acicular, is deflected somad and inclosed only on this side.

The membrane of the first interspace can be discerned everywhere along the line of the wing, except at part of the first phalanx of the third digit.

Skull.—Length, 16½^{mm}; greatest width, 9½^{mm}; least width, 5^{mm}. The sagittal crest is limited, and ends on the anterior third of the mesencephalon. The posterior temporal crest is faintly expressed. Face in advance of orbit 2^{mm}. The occipital crest is interrupted in the center. No tubercle is present over the proencephalic foramina. The vertex of the face provided with a wide depression which extends to the anterior nasal aperture. The fronto-maxillary inflation is conspicuous, extending back of the anterior temporal impression and forming an elevation at the side of the vertex depression. The orbital ridge is small and distinct, is placed well forward, and terminates posteriorly by a tubercle. The inner wall of the orbit is concave; a second tubercle lies directly back of the large lachrymal canal.

The paroccipital process is large, spinous, and is directed obliquely downward and backward for nearly the length of the condyle. The



WING MEMBRANE OF ATALAPHA CINEREA.

mastoid process is well defined, and is slightly produced downward. The interval is smooth, but is deeply incised inferiorly. The line of the superior border of the anterior nasal aperture, if produced, would intersect the first molar. The hard palate is inclined upward. The glenoid cavity has a semblance of a pedicle. The pterygoid process is broad and conspicuously produced. The tympanic bone conceals the cochlea. The bony labyrinth being removed, the region of the semicircular canals is seen to be wider than the cochlea.

The coronoid process is rudimental, and but half the height of the horizontal ramus. The masseric impression involves the coronoid and reaches to the inferior border of the ramus. The angle is flat and does not reach the line of the condyle, and is slightly deflected, so, when seen above, is found to lie to the outer side of the condyle. A well-defined post-symphysal rugosity is present.

The general plan of the ethmoid plates resembles that of *A. noveboracensis*. The parts are, however, of greater height, the interval between the first and second endoturbinals being wider. The second endoturbinal is relatively larger, and curved outward. This arrangement causes the plate to present a concave surface outward, which receives the swollen lower border of the third plate. The median aspect of the first endoturbinal is straight; but the lateral surface is deflected outward, and is impressed on its entire surface by the ectoturbinal which rests upon it, leaving only a raised rim of the endoturbinal round its anterior half. The median surface of the produced portion of the first endoturbinal is nearly as high as it is long. The concave under surface embraces securely the maxilloturbinal.

Maxillary teeth.—The single incisor adjoins the canine and projecting slightly forward and inward. The median surface deeply and sharply excavated and is in contour with the palatal notch. The canine is wedged in between the incisor and the second premolar, posteriorly fluted. Cingulum is entire; median excavation present. The first premolar is minute, conical, placed well to inner side of the axis of tooth row. The second premolar with broad cingulum, with scarcely perceptible protocone, deeply fluted on buccal surface. The first molar resembling Nyctinomus. The protocone is of low development, much as in Macrotus, but is acutely pointed at apex with oblique palatal surface, the posterior commissure obscurely defined on the posterior aspect of tooth, apparently not reaching beyond the apex of the second V. The first V smaller than the second and more deeply fluted on buccal surface. Cingulum defined, but hypocone absent. The second molar much the same as the first; the Vs are subequal. The third molar rudimental. The protocone and commissures are defined, but the posterior limit of the first is imperfect, being defective in buccal half, while the second V is absent.

Mandibular teeth.—The incisors are crowded; the first is the widest and coarsely serrate at the cutting edge, the second and third blunter and less compressed, the posterior basal swelling marked in all. The canine slightly inclined backward, concave on posterior surface. The cingulum entire. The premolars unequal, the first much the smaller. The first and second molars with the anterior limb of the heel joining the smaller V at about the middle of the posterior limb. The commissure on the lingual surface of the heel oblique from behind forward. The third molar with a scarcely triangular heel, which is smaller than the V, blunt, compressed.

Notes on the skeleton.—Atlas with sharply produced downward transverse process, which bears a single foramen. The process back of the transverse process of the presternum equals the length of the process in front of the same. The mesosternum scarcely crested.

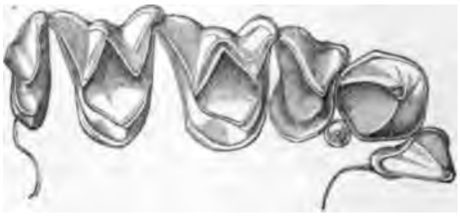
The coracoid process of scapula does not reach to the middle of the glenoid cavity. The end of the process is twice the width of the base; the long process from the scapula spine is greatly curved, and is abruptly widened in the middle. The axillary border resembles that in *Molossus rufus* in being straight for over half its length, and in being thence gradually inclined outward. The upper border is at the superior angle, furnished with a conspicuous spine, which projects toward the glenoid region and lies below the level of the base of the corocoid. The infraspinous fossa is without ridge between the surfaces for the infraspinatus and teres minor muscles; a ridge lies in the subscapular fossa. A facet is seen on the axillary side of the acromion. The clavicle is stouter than in most bats of the size and is more curved than in *Artibeus*, with which it answers in general size.

The humerus with internal tuberosity much higher than the head. The radius is about one and a half times as long as the humerus. The proximal border is produced so as to partake of the olecranoual function of supporting the elbow posteriorly; on the articular surface a deep, narrow groove is bounded by flanges. The distal end with a broad, thin process on the flexor surface directed downward and inward. The outer border is produced, truncate, and appears on the under surface of the bone. The proximal ulnar rudiment does not extend distally beyond the lower border of the depression for the insertion of the biceps muscle; the distal ulnar rudiment is provided with a groove for the flexor tendons.

The carpus does not possess characters distinct from *A. noveboracensis*. The third metacarpal bone with two grooves entire length on one side and one groove on the other.

The first phalanx of the second finger one-fifth the length of the corresponding metacarpal bone. The second phalanges of the third and fourth fingers are slightly longer than the first.

The fifth digit varies slightly as compared with the length of the forearm. No. 5284, U. S. N. M., Nebraska; it lacks one-fifth (*i. e.*, 2) of being as long as the forearm. In No. 3215, U. S. N. M., it lacks but



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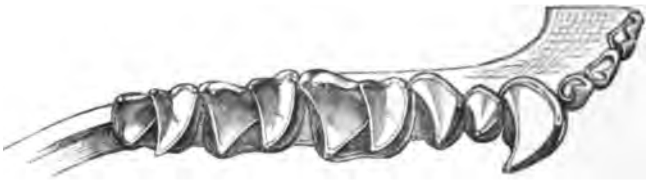

2

1. MAXILLARY TEETH OF ATALAPHA CINEREA. X 8.
2. MANDIBULAR TEETH OF SAME. 8 X.

one-sixth. In the former specimen the fourth metacarpal bone is 2^{mm} longer than the forearm; in the latter it is just as long.

Remarks on sex.—The prebrachial membrane is smaller in the female than in the male, and stops at the distal fourth of fifth of the forearm. In one example only of nine specimens of females examined was a large antebrachial membrane present. Of three males examined two have large antibrachial membranes which extend free to the thumb, while the third terminates at the distal fifth of the forearm. The auricle is thicker in the female than in the male. The penis is furnished with a cauliform prepuce.

Habitat.—According to Le Conte, *A. cinerea* is more common in the Northern than in the Middle or Southern States. Judging from the numbers found in collections, it is a rare bat in the far West. J. B. Tyrrell (*l. c.*) states that it is found in Canada from Nova Scotia to Manitoba. Richardson (American Borealis, 1829, II) obtained it on the Red River in British North America at an altitude of 54°. It is likely that it frequents mountain ranges and table-lands in preference to river valleys or coastwise regions. Mr. Thomas Say reports (Long's Expedition to Rocky Mountains, 1823, I, 167) its collection at Council Bluffs, Iowa. Say (*l. c.*) mentions that Prof. Barton presented a specimen of this bat to the Philadelphia Museum that had been captured in Philadelphia.

C. Hart Merriam (Mammals of the Adirondacks Region, 1886, 176) notes that the flight in this species is swift and irregular. The nightly range is greater than in any member of the fauna. Whenever the temperature of the air is above 59° F. it may be seen on the wing. Like many bats, it is active just before evening and at dawn. It has been caught hanging from a twig of a tree as in the case of *A. noveboracensis.* When kept in confinement it suspends itself by the claws of the feet.

Measurements taken as an average of four individuals.

	Millimeters.
Head and body (from crown of head to base of tail)	68
Length of arm	37
Length of forearm	54
First digit:	
Length of first metacarpal bone	4
Length of first phalanx	8
Second digit:	
Length of second metacarpal bone	59
Length of first phalanx	8
Third digit:	
Length of third metacarpal bone	60
Length of first phalanx	19
Length of second phalanx	23
Fourth digit:	
Length of fourth metacarpal bone	53
Length of first phalanx	11
Length of second phalanx	13

Fifth digit:	
Length of fifth metacarpal bone	45
Length of first phalanx	7
Length of second phalanx	9
Length of head	24
Height of ear	15
Height of tragus	8
Length of thigh	16
Length of tibia	22
Length of foot	11
Length of tail	47

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of forearm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
5280	3.0	2.4	2.0	1.0	4.3	0.6	0.6	0.4	15.3
14 (?)	3.0	2.5	2.2	1.0	4.1	0.7	0.6½	0.4	14.9
147	2.6	1.8	2.0	0.11	4.0	0.6	0.4	0.3	13.4
3255	....	....	2.0	1.0	4.1	0.6	0.4	0.3	12.6
40	3.0	2.0	2.0	0.10	4.2	0.6	0.4	0.4	13.6
4213	2.6	2.0	2.0	0.10	4.2	0.6	....	....	13.6
4728	....	....	2.0	0.8	3.9	0.7	0.3½	0.3	11.6
269	2.0	2.0	2.0	0.11	4.0	0.6	0.3	0.2½	12.6
3098	2.0	....	2.0	0.10	4.0	0.7	0.4	0.2½	....
1743	2.0	2.0	2.0	0.10	3.8	0.6	0.4	0.3	10.0
73	2.6	2.0	2.0	0.12	4.0	0.6	0.4	0.3	12.0
93	3.0	....	2.0	0.11	4.0	0.6	....	0.4	11.6
873	2.6	2.0	2.0	0.11	4.0	0.6	0.4	0.3	12.6
883	2.6	2.0	2.0	0.12	4.1	0.6	0.4	0.3	14.0
415	2.6	2.0	2.0	0.10	4.0	0.6	0.4	0.3	14.0

List of specimens.

Cat. No.	No. of specimen.	Locality.	Presented by—	Nature of specimen.	Collection.
5280	1	Halifax, N. S	Dr. Gilpin	Alcoholic	U. S. N. M.
6184	1	British America	R. Kennicott	....do	Do.
5286	1	Red River settlement	D. Gunn	....do	Do.
5417	1	Cleveland, Ohio	Dr. Kirtland	Dry	Do.
5421	1	Little Blue, Kans	W. S. Wood	....do	Do.
5281	2	St. Louis, Mo	Dr. G. Engelmann	Alcoholic	Do.
5283	1	Grand Coteau, La	St. Charles College	....do	Do.
5328	2	Fort Pierre, N. Mex	D. J. Evans	....do	Do.
5284	2	Near Fort Union, N. Mex	Dr. Hayden	....do	Do.
5422	1	Fort Pierre, Nebr	......do	Dry	Do.
4213	1	Neosho Falls, Kans	B. F. Goss	....do	Do.
5415	1	South Fork Platte	F. V. Hayden, MD., U. S. A. (?)	....do	Do.
3768	1	La Boule River, Utah	(?)	....do	Do.
5414	1	Donna Anna, N. Mex	Dr. T. C. Henry	....do	Do.
5282	5	Matamoras	Lieut. Couch, Berlin College	Alcoholic	Do.
4728	1	"United States"	....	Dry	Do.
5286	2	Monterey, Cal	A. S. Taylor	Alcoholic	Do.
5287	1	Petaluma, Cal	E. Samuels	....do	Do.

Group MOLOSSI.*

* MOLOSSI.—So intimate is the relation between this group and the Vespertilionidæ that I decline to give it the value of a family. The characteristics elsewhere noted are here taxonomically arranged. It appears to be subordinated to the Vespertilionidæ, and for the present, at least, I shall place it as an alliance thereto. The Molossi, like the Vespertilionidæ, are adapted to cosmopolitan range by the adaptation to both terrestial and aeriel locomotion. The wing is stout, narrow, and muscular. With the Vespertilionidæ the ethmoidal plates are volute, the trapezium is fur-

Genus **NYCTINOMUS** Geoffroy.

Nyctinomus Geoffroy, Descript. de l' Egypte, II 1812, 114; H. Allen, Monog. N. A. Bats, 1864, 5; Dobson, Cat. Chirop. Brit. Mus., 1878, 437; Alston, Biolog. Centrali-Amer., Mamm., 1879–82, 33.

This genus is in close relation with *Molossus*. It is distinguished by the absence of union of the palatal plates of the premaxilla. Teeth with large hypocone. Auricle with internal basal ridge, developed into a well defined "keel;" the external basal ridge continuous with an erect external basal lobe. Auricle quadrate; metacarpo-phalangeal joint of third and fourth digits mobile, bent forward; the interphalangeal joint of the same digits mobile, bent backward (these digits when extended reach far below the level of the toes); the joints of the fifth digit rigid and in line with the metacarpal. The second metacarpal lies palmad to the third; the phalanx is rudimental or absent.

Nyctinomus is of wide distribution, examples being found in all parts of subtropical and tropical regions. With the exception of *N. norfolcensis* (Australia, Norfolk Island) and *N. johorensis* (Malay Peninsula), the species are singularly alike in essential features. A critical examination of all the species is demanded before the exact position of the North American forms can be determined.

The North American species considered in the following pages are *N. brasiliensis* and *N. macrotis*. I have not seen *N. femorosaccus* Merriam (N. A. Fauna, No. 2, 1889, p. 23), or *N. mohavensis*, Merriam (N. A. Fauna, No. 2, 1889, p. 23), both from southern California. (See Appendix.

1. **Nyctinomus brasiliensis** Isid. Geoffroy. (Plates XXXII, XXXIII.)

Molossus nasutus Spix, Sim. et Vesp. Bras., 1823, 60, pl. XXXV, fig. 7; *fide* Isis, August, 1824, 899 (Brazil); Schinz, Syn. Mam. I, 1844, 143.

Dysopes nasutus Temminck, Mon. Mam. I, 1827, 234. *ib.*, Zoöl. Jour., III, 1828, 459; Wagner, Schreb., Säugeth., Suppl. I, 1844, 474; *ib.* V, 1855, 711.

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nished with a palmar tubercle, and the coracoid process is always bifid, the posterior portion being prolonged.

A large spheno-palatine foramen is present, while the presence of palatal processes to the premaxillæ is detected in most of the genera. The tail is always produced well beyond the interfemoral membrane, and the accessory cartilage is absent from the short, rigid fifth digit.

The groups of the Molossi constitute a subfamily characterized by the narrow wing, prominent thumb, free terete tail, and the rigidity of the short fifth digit. The group at one end recalls the subfamily Emballanurinæ in the dorsal flexion and adduction of the metacarpo-phalangeal and interphalangeal joints of the third digit, characters it possesses in common with most forms of the Emballanurinæ. The types of upper molar, namely, in the presence of a hypocone, is also met with in *Emballanura*. The last upper molar in both groups exhibits a nearly perfect second V. The large hypoconid in the last lower molar is repeated in all the emballanurines including *Furia*. Adaptation to active motion with wing at rest is seen in all. The greatest degree of the adaptation last named is seen in *Cheiromeles* of Borneo, though the other genera of the group are rapid flyers.

Nyctinomus nasutus (snouty bat), Tomes, Proc. Zoöl. Soc. London, 1861, 68 (Jamaica). H. Allen Monog. N. A. Bats, 1864, 7.

Nyctinomus brasiliensis Isid. Geoff., Annal. des Sci. Nat., 1, April, 1824, 337, pl. XXII (Brazil); *ib.*, Zoöl., Journ., I, 1825. 133; Ferussac, Bull. des Sci. Nat., II, 1824, 74; Dobson, Cat. Chirop. Brit. Mus., 1879, 437; Alston, Biolog. Centrali-Amer., 1879-82, 33.

Nyctinomus murinus Gray, Griffith's Cuv. An. Kingdom, V., 1828, 66.

Nycticea cynocephala Leconte, Cuv. An. Kingdom (McMurtrie's ed.), I, 1831, 432 (South Carolina).

Molossus cynocephala Cooper, Ann. Lyc. Nat. His. N. Y., LV, 1837, 65, pl. III. fig. 1; Wagner, Schreb., Säugeth., Suppl. V, 1855, 714.

Molossus fuliginosus Cooper, Ann. Lyc. Nat. His. N. Y., LV, 1837, 59, pl. III, fig. 3 (South Carolina).

Rhinopoma carolinensis Gundlach, Archiv f. Naturgesch., 1840, 358, (*not* of Geoff., in Desm. Mam., 1820, 130, and Dict. d'Hist. Nat., XLV, 1829); Leconte, Proc. Acad. Nat. Sci. Phila., VII, 1855, 437.

(?)*Dysopes naso* Wagner, Schreb., Säugeth., Suppl. I, 1840, 475.

(?)*Nyctinomus mexicanus* and *N. aztecus*, Sauss., Rev. et Mag. de Zoöl., XI, 1860, 283.

Diagnosis.—Muzzle truncate, with numbers of spines on upper border, but none on the vertical internarial ridge. Spines also on the inner border of the auricle. Dorsum of face furnished with long stout bristles. Fur of a dull mouse gray, paler beneath. The first phalanx in the third, fourth, and fifth digits, exceeds in length the second. Second phalanx of the fourth digit over half the length of the first phalanx. The tail beyond the level of the toes is free.

Description.—The muzzle with a deep emargination between the nostrils. A vertical band without a groove or spine extends on the muzzle to the lip. A small post-mental wart is present. The ears are one-half to 1^{mm} apart on the face.* The median border of the ear is sinuate near its attachment to the head. The outer border is notched at the upper third so that the entire edge may be said to be scalloped; the border below the side of the scallop is thin, and everted as far as the line of the external basal ridge. The border ends abruptly at the anterior edge of the base of the external basal lobe which is broader than high and higher posteriorly than anteriorly. In some specimens the antitragus is continued forward by a skin fold to the angle of the mouth. The notch between the external basal ridge and the external basal lobe is inconspicuous not reaching one-half way to the base. The tragus is quadrate, measuring 4^{mm} along the posterior border and $1\frac{1}{2}^{mm}$ along the anterior.

The fur is silky on the back of the head and basal half of ears; the trunk and sides of the neck are plumbeous verging to drab or dusky brown; the base is everywhere white but the extent of the color is variable. On the sides of the neck the white color is most marked, and on the lower part of the back and rump it is least so. A silvery tint is seen on the tips when they are seen in an oblique light. The sides of the trunk are much lighter in hue and are unicolored. The

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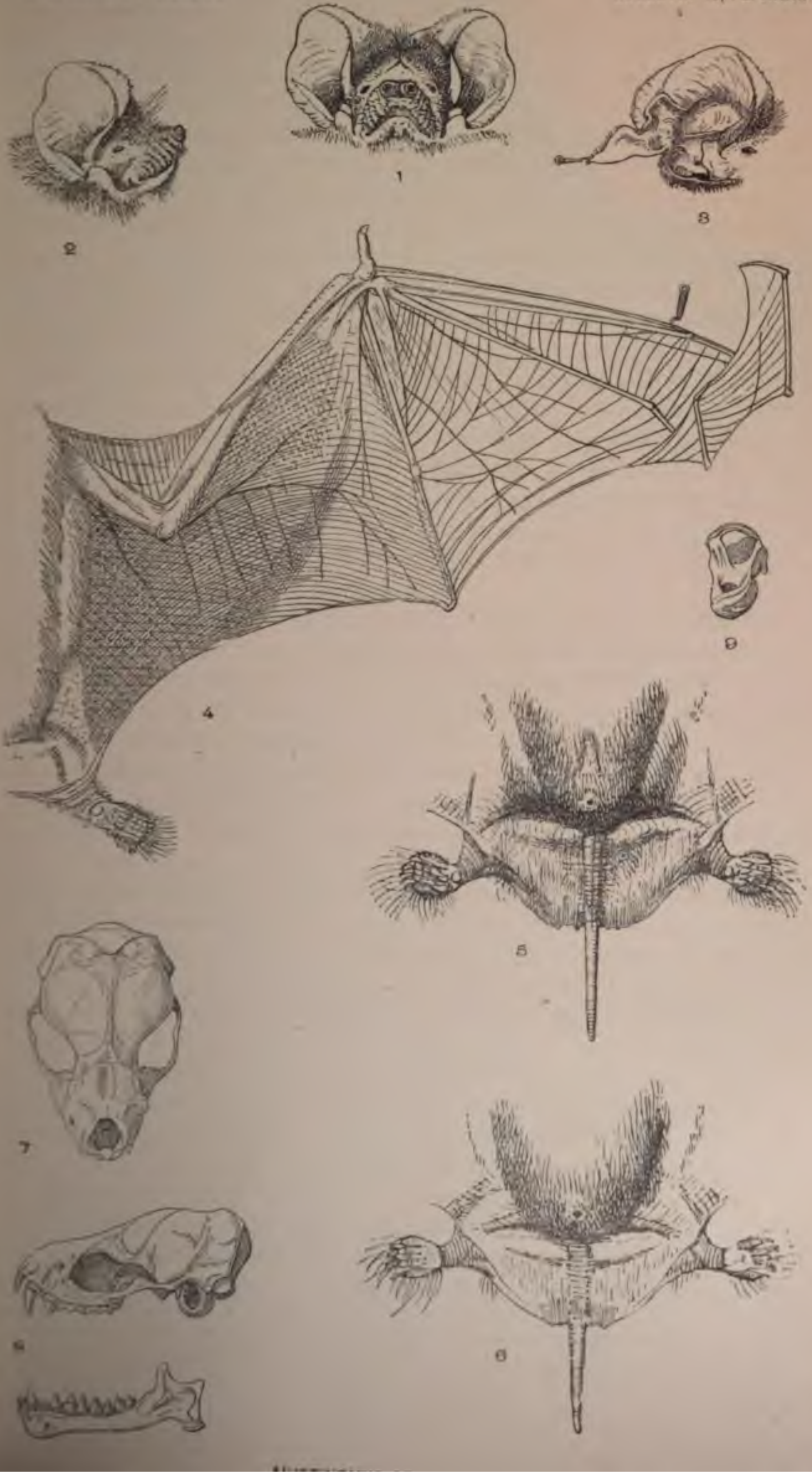
*Unless close examination be made the ears appear to be united. Thus Coues and Yarrow (Wheeler's Exped., Zoöl., 1875) describe them as united over the vertex.

EXPLANATION OF PLATE XXXII.

FIG. 1. Front view of head of *Nyctinomus brasiliensis*.
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane of *Nyctinomus brasiliensis*, western form.
FIG. 6. Tail and interfemoral membrane of same, eastern form.
FIG. 7. Skull seen from above.
FIG. 8. Skull and lower jaw seen from the side.
FIG. 9. Os petrosa.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fur extends on the membranes from a point at the proximal third of the humerus to the distal two-thirds of the femur and is thicker along the margin than where it is continuous with the body. On the venter the fur is intermediate in shade between that of the back and the side of the trunk. It is either unicolored or barely white at the base. The prebrachial membrane is naked or furnished with a small patch of hair.

The face is naked over the dorsal surface except in the space between the median border of the auricle and the nostril where a number of long 3^{mm} to 4^{mm} stout bristles are found.* In the female not infrequently a whitish diffused patch is seen on each side of the neck near the lower jaw. A few long white hairs adorn the pubis. Occasionally the male has a patch similar in color to the above growing on the post-mental space.

Membranes.—The entopatagium without markings from the intercostal or lumbar nerves. The line of the coraco-brachialis fascicle becomes apparent at the middle of the humerus, passes vertically downward medianly to the elbow, and divides, at lower two-thirds of the membrane, into two branches. The lower runs forward to a point lateral to the elbow, *i. e.*, in advance of the joint. The triceps fascicle system with a plesh of superior branches. The terminal part of nerve abruptly deflected downward.

The first oblique band at the radiometacarpal angle is attached to the first metacarpal bone. It crosses the palm obliquely, and reaching the mesopalafium lies for 4^{mm} close to and parallel with the radius. The pouch is distinct. The tendon of the palmar interosseus muscle of the fifth finger makes no impression upon the membrane. A broad, dusky band, apparently due to the membrane becoming contracted in this line, extends obliquely from the lower end of the tibia to the wrist. It is conspicuously seen in all specimens which are held up to a strong transmitted light.

The fourth interspace shows a nerve appearing at the angle anteriorly. This soon divides into two branches, a posterior and an anterior. The posterior passes obliquely across the membrane to reach the fifth finger at the distal third, where it disappears. Before doing so it yields a branch, which is distributed to the posterior half of the membrane. The anterior nerve keeps close to the fourth finger. At its proximal fourth it is lost in the contour of the bone. Just before its termination it sends off a large posterior branch, which supplies the anterior of the interspace. In the third interspace a long main nerve is seen dividing into two branches. In the second interspace a posterior nerve appears at the proximal third of the first phalanx of the fourth finger, and an anterior from the proximal third of the first phalanx of the third finger. The ectopatagium is attached on the distal end of the second phalanx of the fifth finger, while the mesopatagium

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*The bristles about the nostrils have been neglected in describing species of *Nyctinomus*. They are conspicuous in *N. brasiliensis*, while almost absent in *N. plicatus*.

is attached to the tip of the third phalanx, thus the median border of this phalanx is without membrane. The third phalanx is directed obliquely toward the body. The third phalanx of the fourth finger is deflected parallel to the free margin of the membrane of the third interspace away from the body, and presents a well-defined free inferior border. The third phalanx of the third finger exhibits a distinct cutaneous flange or hem on the free border. Thus all the terminal phalanxes are in part or in whole free from the wing membrane on one border. The tail membrane with an indistinct band extending from the knee inward from knee one-half the way to the tail. The inferior margin presents a well-marked lobe near the tail.

Variations.—A variety of *Nyctinomus* from California differs from others examined in the presence of plantar tubercles, and in the large size and good definition of the calcaneal tubercle (pl. XXXII, fig. 5). It is further distinguished by the females exhibiting well-defined spines on the median vertical ridge of the muzzle. In the males these are supplanted by small tubercles, or the ridge is entirely smooth. In four examples, three of which were males, the chin was furnished with two small, symmetrically placed warts. No similar appendages have been noted in the genus. In one female an elongated wedge-shape plate defined the mentum. The specimens were 22 in number; males 9, female 18. The females were disposed to be slightly larger than the males, and to possess unusually marked masses of fat in the anterior abdominal wall and at the groin. Should increased knowledge of this variety make it desirable to assign it a distinct name it may be regarded as *Nyctinomus brasiliensis californicus.*

The assertion that the ears are disunited is sustained by many examinations. However, in a specimen (No. 6045, Mus. Comp. Zoöl.) the ears are united by a band 1^{mm} high.

In three specimens from the island of St. Kitts (6019, 6020, 6021 Mus. Comp. Zoöl.) the tail was free for 9^{mm} only.

N. pumilus, from the Bogas country, Africa, resembles the species last named in the length of the second phalanx of the fourth finger, such length being over twice the length of the corresponding phalanx in other species of the genus examined. One female of this species has been examined from the collections of the Museum of Comparative Zoölogy.

The following observations on this species may be of use in studying *N. brasiliensis:* The muzzle is without spines. The lips are much hicker than in *N. brasiliensis;* they are wider than the muzzle is high. The few stout bristles on the face are much less conspicuous than in *N. brasiliensis.* The ears are united for a height of 4^{mm}. The keel of the auricle is 5^{mm} long. The ears are rounded without a scallop on posterior border; the free portion below the head measures 6^{mm}. The antitragus is higher than broad and is 4^{mm} wide at the base. The sides of the tragus are of equal height, quadrate, and measure a little less than 1^{mm} in all proportions. They are directed obliquely backward, so that the upper border is vertical. On the mesopatagium the first oblique band is small and indistinct. It is attached to the side of the fifth metacarpal bone (*i. e.*, it is free from the muscle mass). The pouch is indistinct. The submentum is provided with a distinct wart, but no median ridge lies between the wartand the lower lip, as in *N. brasiliensis.*

Maxilliary teeth.—The incisor of each side is slender, simple, obliquely directed downward and inward, but not touching its fellow. A wide space exists between it and the canine. The canine is slender, vertical, scarcely produced beyond the second premolar; cingulum produced posteriorly. To the outer side of this prolongation, but set in slightly from the outer limit of the tooth series, is seen the minute first premolar. The second premolar with well-defined protocone and fluted paracone—the heel-like projection of the cingulum is discernible. The first molar possesses a sharply defined acute protocone of low elevation, the commissures embracing the two V's. The paracone is slightly smaller than the metacone. The hypocone unusually well defined, often almost as high as the protocone and sometimes bilobed. The second molar as the first, but with equal cusps and simple hypocone. The third molar with protocone as in other molars. The anterior V slightly compressed. The posterior V with anterior limb entire; posterior limb absent. The molars do not touch except at their buccal surfaces.

Mandibular teeth.—The incisors, three in number, the first and second equal or subequal, bilobed, without basal cusps. The third much smaller, wedged in between the second and the canine, and is often lost. The canine with sharply defined cingulum entirely round the tooth. The premolars slightly crowded, the first the smaller. Of the molars the V is smaller than the heel throughout. The anterior limb of the heel adjusts against the V at about its middle. The triangle composed of paraconid, metaconid, and protocinid is much compressed from before backward. The paraconid not inclined forward as is seen to be the case in *Atalapha* and *Macrotus*. The commissure at the base of the heel is conspicuously cuspidate. In the third molar it, in addition, bears a second small acicule. The cingulum is visible throughout at the base on the buccal surface.

Skull.—Greatest length, 15^{mm}; greatest width, 10^{mm}; least width, 4^{mm}; length of face from orbit, $3\frac{1}{2}^{mm}$; distance from infraorbital foramen, to the tooth row, 1^{mm}. The sagittal crest is defined the entire length; weaker posteriorly. The posterior temporal crest is trenchant, forming with its fellow the sides of a broad-based triangle, 2^{mm} long. The mesencephalon is 3^{mm} long. The anterior temporal crest ends on the orbital crest, which is sharply outlined and as long as the orbit is high. The inner wall of the orbit is flat. The vertex of the face provided with a median groove which begins abruptly at the junction of the sagittal with the anterior temporal crests and reaches a point half way to the anterior nasal aperture. The fronto maxillary inflation extends over the entire face vertex. The short infraorbital cana is provided with an elevated ridge-like outer wall, which carries a pit. A large foramen unites the nasal chambers near the posterior nasal aperture with the mesopterygoid fossa. The otic foramen converted into a notch, thus permitting the otic capsule to be exposed the entire length on the side of the skull. The paroccipital process is inconspicuous and ends at a point about on a level with the mastoid process The interval is occupied entirely by the otic capsule. The tympanic ring is complete. The sphenoidal tongue is rudimentary or absent. The coronoid process is less than half the height of the horizontal ramus. The angle is scarcely produced back of the line of the condyle. The interval between the two is almost straight. The angle is broad, flat, acuminate and is markedly deflected outward so as to be almost free from the line of the condyle when seen from above. The masseteric impression is deep but does not reach the lower border of the ramus. The post-symphysal process is absent. The incisive notch deep as in *vespertilio* and allies.

The following notes will be of interest in connection with the study of the skull of *N. brasiliensis:*

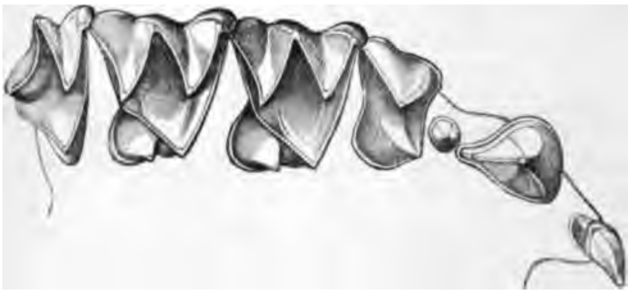
N. orthotis.—The sagitta is well defined. The face vertex is elevated with scarcely any depression. The fronto-maxillary inflation is rudimentary. The zygoma is without elevation on the upper border. The basisphenoid fossæ is well marked. The postpalatal spine is absent. The infraorbital canal is long, permitting the line of the anterior nasal aperture to fall back of the facial foramen. The coronoid is less elevated, while the angle is longer and less acuminate, and lies far beyond the condyle.

N. norfolcensis.—The sagittal crest is absent. The face vertex is with shallow depression, but conspicuous orbital ridge and lachrymal tubercle. The coronoid process is high, greatly exceeding the width of the adjacent ramus. The angle is widely deflected from the line of the condyle.

N. europs.—The sagitta is absent. The orbit crest is scarcely defined. The lachrymal tubercle small. The zygoma is without elevation on the upper border. The coronoid process above the line of the condyle is a mere tubercle, and greatly less than the width of the adjacent ramus.

Notes on the skeleton.—Atlas: The lower opening for the vertebral artery is much larger than the upper; below it a spine projects downward and outward.

Scapula: The upper half of the subscapular fossa limited inferiorly by an oblique keel. The vertebral border of this subfossa is concave



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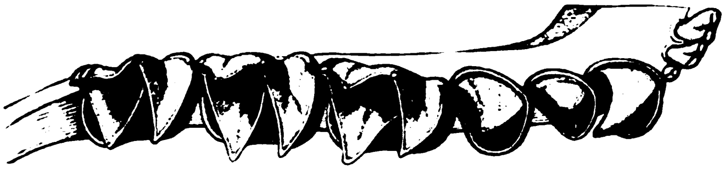

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1. Maxillary teeth of Nyctinomus brasiliensis. x 12.
2. Mandibular teeth of same. x 12.

and deepened somad, especially at the angle, where a large recurved process from the border is seen. The coronoid extends toward this process and nearly reaches it: thus the coronoid is not curved downward as in the case generally in other than the molossids. The lower lip of the glenoid cavity projects markedly, making the glenoid very concave; the lateral margin is convex; the median margin is straight. The triceps impression is strictly axillary, with a greater tendency to encroachment on the dorsum.

Humerus: Axis of head very oblique to the axis of the shaft. The pectoral ridge equals one-fifth the length of the shaft The external tuberosity greatly exceeds the inner in height. The epitrochlea is produced as a spine, which reaches below the trochlea. The inner half of the trochlea is scarcely grooved anteriorly.

Ulna: The proximal part of the ulna equals half of the length of the radius; the articular surface bears a longitudinal crest. The distal part form a quadrate imperforate plate.

Pelvis: The innominate bones do not unite at the symphysis. Each bone is firmly anchylosed to the sacrum. The symphysal border is three times as long as the pectineal spine. The thyroid foramen is nearly circular. The sacrum is composed of three elements, the spines of which increase from above downward. The caudal vertebræ are eleven in number. The first two resemble the sacral elements in having broad, flat, conjoined lateral processes. The others are like caudal vertebræ generally in mammals.

Habitat.—Subtropical and tropical America apparently everywhere abundant. It is sometimes so numerous in the Southern cities of the United States as to render houses uninhabitable by their disagreeable odor and the noise they make in moving about.

I had an opportunity in December, 1880, to study a number of living animals which had been collected by Mr. James Bell at Gainesville, Fla., and sent to me by Prof. Baird. They did not resist handling and made no defense. The mouth was not open in excitement, nor was any cry emitted; a slight purring sound was occasionally heard. The feet were used to dress the fur and to scratch; the outer side of the thigh was easily reached by abducting the foot, the last-named act being induced doubtless by the long peroneal muscle, the knee at the same time being moderately flexed. Extension of the wing often occurred (as though in preparation for flight), as terrestrial animals stretch their limbs in arousing from sleep. In such a movement the inferior extremity was abducted by the traction of the fifth finger on the wing membrane. In standing the trunk was prone, the head slightly elevated, the wings folded, the toes separated, the first and fifth toes being farther apart from their neighbors than were the second and third from one another. The foot was dorsiflexed and the plantar surface was on the ground. Walking was accomplished with ease and carried the little creature quickly along. The manus in this act remained folded, and the motion appeared to be made up of the arm and forearm acting as one factor, the callosity over the first metacarpal bone serving as a point of resistance. In taking flight from a flat surface the animal appeared to spring into the air as a lizard jumps, no one portion of the body appearing to move more than another; but it is probably true that most of the act was accomplished by the arm and forearm. In coming to rest at the end of flight the wings often remained extended for a little while; sometime one would be folded when the other was kept extended. When placed on a horizontal surface, as a table top, the animal scurried to the edge and often hung partially over. The flexible loin enabled the pelvis and lower extremities to remain on the top of the table, while the rest of the trunk was pendent on the side. A number of the bats were allowed to escape in a large room. They moved freely about the surface of a large table and made short flights to neighboring objects. No food was partaken of, and at the end of a few days they became listless and, since it was evident that they could not thrive, they were killed by immersion in spirits.

Measurements. An average taken from five individuals.

	Millimeters.
Head and body (from crown of head to base of tail)	49
Length of arm	21
Length of forearm	40
First digit:	
Length of first metacarpal bone	3
Length of first phalanx	4
Second digit:	
Length of second metacarpal bone	38
Length of first phalanx	..
Third digit:	
Length of third metacarpal bone	38
Length of first phalanx	14
Length of second phalanx	14
Fourth digit:	
Length of fourth metacarpal bone	38
Length of first phalanx	12
Length of second phalanx	8
Fifth digit:	
Length of fifth metacarpal bone	24
Length of first phalanx	11
Length of second phalanx	5
Length of head	..
Height of ear	13
Height of tragus	4
Length of thigh	..
Length of tibia	11
Length of foot	7
Length of interfemoral membrane	..
Length of tail in membrane	15
Length of tail free from membrane	15

Measurements from first edition of Monograph.

Current number.	From tip of nose to tail.	Length of tail.	Length of forearm.	Length of tibia.	Length of longest finger.	Length of thumb.	Height of ear.	Height of tragus.	Expanse.	Nature of specimen.
	In.	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	*In.*	
5253	2.6	1.3	1.7	0.6	3.0	0.4	0.7	0.2	11.0	Alcoholic.
5494	2.6	1.1	1.9	0.6	3.0	0.4	0.7	0.2	10.3	Do.
	2.6	1.0	1.7	0.6	3.2	0.3	0.6	0.2	10.0	Do.
5227	2.4	1.3	1.6	0.6	3.2	0.4½	0.6	0.2	9.9	Do.
5219	2.3	1.3	1.6	0.6	3.0	0.3	0.7	0.2	10.0	Do.
	2.3	1.2	1.7	0.6	3.0	0.3	0.7	0.2	10.6	Do.
	2.0	1.3	1.6	0.5	3.0	0.3	0.7	0.2	10.4	Do.
5225	2.2	1.2	1.6	0.6	3.0	0.3	0.7	0.2	10.3	Do.

List of specimens.

Cat. No.	No. of specimens.	Locality.	Presented by—	Nature of specimen.	Collection.
5475	1	Upper Rio Grande	Dr. T. C. Henry	Dry	U. S. N. M.
5473	1	El Paso	J. H. Clark	do	Do.
5225	1	Eastern Texas	do	Alcoholic.	Do.
5219	3	Pecos to Rio Grande	Capt. J. Pope	do	Do.
5496	2	Grand Coteau, La	St. Charles College	do	Do.
5223	1	Matamoras	Lieut. Couch	do	Do.
5227	1	Fort Yuma, Cal	Maj. G. H. Thomas	do	Do.
4742	1	"U. S"	Maj. Leconte	Dry	Do.

2. Nyctinomus macrotis nevadensis H. Allen. (Plates XXXIV, XXXV.)

Nyctinomus macrotis Gray, Ann. Nat. Hist., IV, 1839, 5; Dobson, Proc. Zoöl. Soc. London, 1876, 729, Fig. 6.

Dysopes auritus Natt, Wagner, Wiegm. Archiv, 1843, 368; Burmeister, Thiere Brasiliens, 1854, 69.

Dysopes laticaudatus and *cæcus* Rengger, Säugeth. Paraguay, 1800, 88.

Dysopes aurispinosis Peale, U. S. Explor. Exped., VIII, 1844, 21.

Nyctinomus auritus Peters, MB. Akad. Berlin, 1865, 573.

Two specimens from Nevada in the National Museum present many characters in common with *N. macrotis*, as this species is described by Gray* and Dobson†. In both forms the ears are united by a band, the keel of auricle is curved upward and backward, the tragus is small and of the quadrate type, the ear-conch is thin and translucent, and the terminal phalanx of the fourth finger measures but 2^{mm}, and is shorter than terminal phalanx of the fifth finger. There is also a general agreement in other measurements. Nevertheless, the specimens can not be received into any of the species of *Nyctinomus* hitherto descibed. As compared with descriptions of *N. macrotis*, its nearest ally, the muzzle is not "concave" between the ears. The tragus is convex above instead of being "straight or concave," nor does its lower half form a "prominent angular projection." The fur, instead of being of a "reddish-brown beneath and above," is, on the dorsum, of a uniform dark plumbeus (mouse color), the base of the fur being the same as the tips. A faint line of fur extends along the forearm to the distal one-fifth. The fur on the venter is slightly lighter in tint, that of the chest being a shade darker than that of the abdomen. But, on the whole, the dorsum and venter may be said to be of the same general tint. The endopatagium is without a naked space alongside the body.

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*Ann. Nat. Hist., IV., 1839, 5.

†Cat. Chirop. Brit. Mus., 1878, 435.

The keel of the auricle does not project outward beyond the antitragus. The manner of termination of the outer margin of the auricle on the antitragus is not described by authors. Judging from Dobson's figure (Pl. XXII, Fig. 6), the margin reaches the outer surface of the antitragus, while in the Nevada specimen it ends on the middle of the external basal process. The outer margin of the auricle is uniformly rounded.

The American species of *Nyctinomus* are not variable to any marked degree, and the characters just given are of greater significance than would be the case in some other genera. But the variations in the form of the tragus in Chiroptera are always associated with other characters; that is to say, the form of the tragus is an index to variation. The slightest modification in outline from the one accepted as typical of the species is associated with some other minor changes in the general periphery. Respecting the color, it may be said that the mouse tint of the Nevada specimens is not described in any species of *Nyctinomus*, and is therefore probably not a variation in the color of *N. macrotis*.

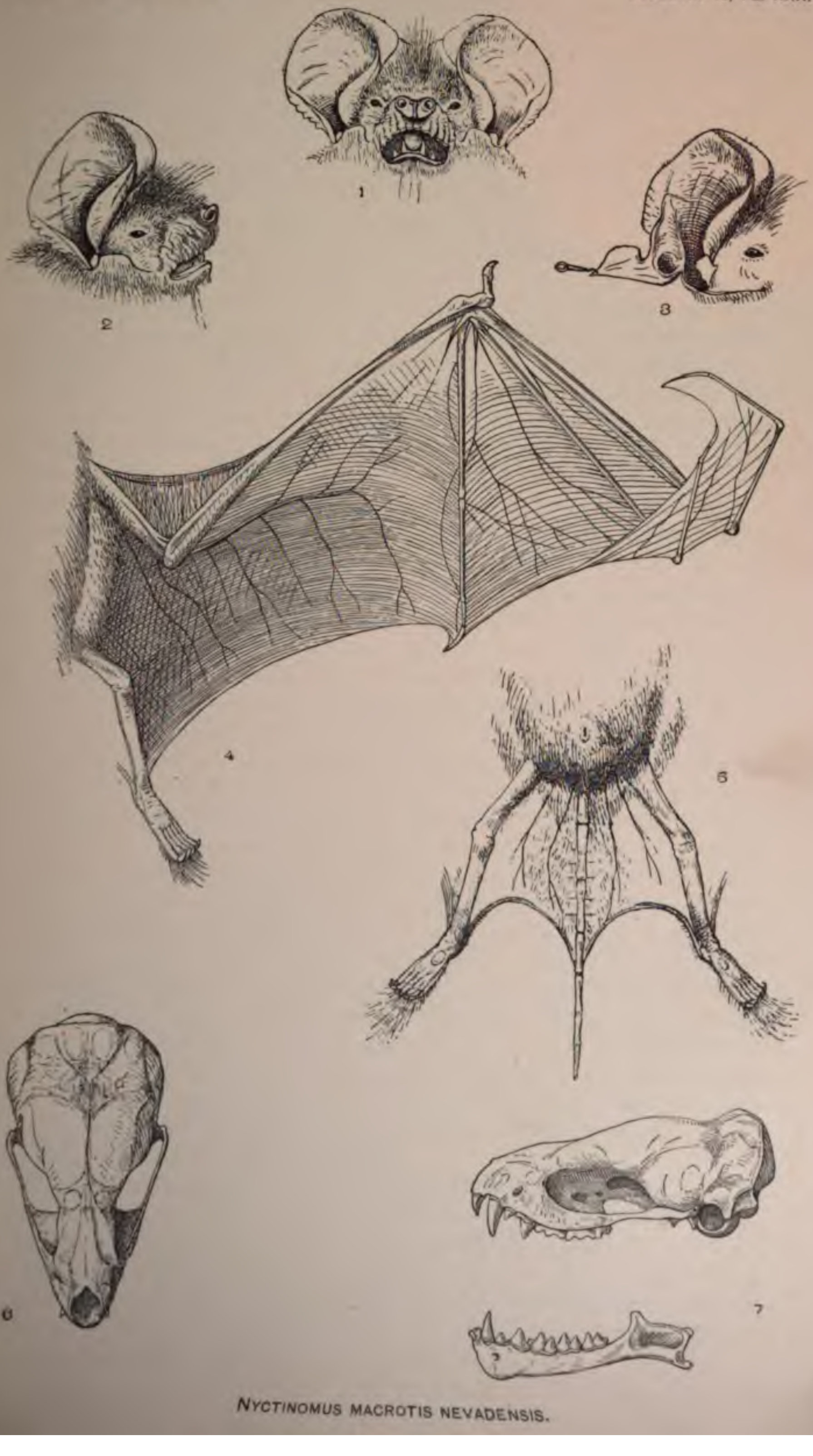
Description.—Muzzle with sharply defined upper borders, with deep emargination between them. The border furnished with numerous pectinate spines, except over the nostrils, where their place is taken by minute papillæ. In the younger of the two specimens the muzzle presents a few scarcely discernible spines on upper border. Vertical ridge on front of muzzle papillate; in general character as in *N. brasiliensis;* well defined ridge on mentum; no submental wart apparent, but a single long hair grows from the center. The ears are thin, semitranslucent, united by a band 1^{mm} high, and a faint ridge extends 2^{mm} in front of commissure. Three small spines are seen on the internal border. The keel is 9^{m} long, folded back, and of the same consistence as rest of the auricle; four minute spines are seen on the upper border of the auricle. A faint, shallow scallop is seen where the revolute flange of the auricle is defined. The antitragus is broader than high, 4^{mm} at base, 2^{mm} high. The notch back of it reaches to the base of the antitragus. The inferior extremity is well defined on the venter, that is to say, that the pubo-tibial fold is absent.

The second phalanx of the fourth finger is 2^{mm} long. In this regard *N. macrotis* resembles *N. megalotis* and *N. gracilis;* and is distinguished from *N. brasiliensis*, in which this phalanx is 7^{mm} long. With Old World forms comparisons may be made with *N. pumilus* and *N. africanus*, in both of which this phalanx measures 7^{mm} in length.

— entopatagium with coraco-brachialis fascicle dividing at upper membrane, its anterior division reaching line of elbow and

EXPLANATION OF PLATE XXXIV.

FIG. 1. Front view of head of *Nyctinomus macrotis nevadensis.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Wing membrane.
FIG. 5. Tail and interfemoral membrane.
FIG. 6. Skull seen from above. x 2.
FIG. 7. Skull and lower jaw seen from the side. x 2.



NYCTINOMUS MACROTIS NEVADENSIS.

extending thence vertically to within a millimeter of free margin. Other nerves of the wing membrane and the terminal phalanges as in *N. brasiliensis.* The tail membrane with a well-defined line extending from the middle of the thigh to the free margin of the membrane.

The first oblique band at the radis-carpal angle is attached to the muscle mass at the base of the fifth metacarpal bone parallel to radius. It measures 5^{mm}. The pouch is indistinct.

A fibrous band lies to the inner side of the fifth metacarpal bone. *N. brasiliensis* has none.

Maxillary teeth.—The incisor is cuspidate. The canine without posterior basal prolongation and in contact with the first premolar, which, while small in size and simple, is larger than in *N. brasiliensis* and is retained in the axis of the tooth row. The remaining teeth, as in the species last named, with the exception that the posterior limb of the second V is complete and more than half as long as the anterior limb.

Mandibular teeth.—Incisors two in number, flat crowned, deeply bilobed. The remaining teeth much the same as in *N. brasiliensis.*

Skull.—Length, 22^{mm}; mesencephalon, 5^{mm}; greatest width, 10^{mm}; least width, 4^{mm}. Length of face from infraorbital canal, 4^{mm}. The paroccipital process is broad at the base, subacuminate, not reaching to the line of the middle of the condyle and no longer than the mastoid. The interval occupied by the otic capsule, which, with the exception of a small portion crossed by a process of the squamosa, is exposed. The face vertex is scarcely inflated at its widest part, is very little wider than the region of the proencephalon. The region of the lachrymal bone is marked by a tubercle. The orbital crest is conspicuous and not produced. The line of the upper border of the anterior nasal aperture if produced would intersect the dental arch immediately back of the canine. The opening from the mesopterygoid fossa to the orbit is large. The sagittal crest is small and confined to the region of the prœncephalon and metencephalon. The interval between the faintly marked posterior temporal crest and the occipital crest is elevated, rounded, and not triangular. The sphenoidal tongue is rudimental and is not disposed from the horizontal. The basisphenoid dossæ is conspicuous. The tympanic bone is large and inflated; the mastoid region small, nodular; the basi occipital is narrrow without latteral depressions, which are so conspicuous in *Artibeus*; the round foramen of the sphenoid bone separated from the sphenoidal foramen by a septum; the pterygoid process a delicate spine; the vomer extends to the posterior border of the hard palate.

The small coronoid is scarcely elevated above the level of the condyle, but is one-half the width of the adjacent part of the horizontal ramus. The angle is broad, flat, and scarcely produced beyond the condyle. Seen from above it is so deflected that it lies just at the outer border of the condyle. The posterior border of the ascending ramus is slightly concave. The masseteric impression is shallow and leaves a broad interval between it and the lower margin of the ramus.

Since I have never seen *Nyctinomus macrotis* in the adult form, or from localities from which it was first collected, I have thought it best to identify the specimens described as *N. macrotus nevadencis.*

In specimen No. 15178, the head and body measures 60^{mm} which is probably nearer the adult than in the preceding example. The length of the arm is 25^{mm} and that of the forearm 54^{mm}. The other measurements are not of sufficient value to be separately made.

Habitat.—Nevada and California, according to Dobson, *N. macrotis* has been collected in Cuba and Brazil (Mato Grosso), and Paraguay. This writer assigns *Dysopes aurispinosus* of Peale to *N. macrotis.* In this connection it is of interest to state that Mr. Peale collected *D. aurispinosus* at sea. The specimen flew on the vessel off the coast of Brazil 100 miles from land.

MEASUREMENTS.

[No. 15178, U. S. N. M.]

	Millimeters.
Head and body (from crown of head to base of tail)	
Length of arm	28
Length of forearm	52
First digit:	
Length of first metacarpal bone	3
Length of first phalanx	4
Second digit:	
Length of second metacarpal bone	45
Length of first phalanx	
Third digit:	
Length of third metacarpal bone	46
Length of first phalanx	15
Length of second phalanx	12
Fourth digit:	
Length of fourth metacarpal bone	42
Length of first phalanx	12
Length of second phalanx	2
Fifth digit:	
Length of fifth metacarpal bone	24
Length of first phalanx	15
Length of second phalanx	4
Lenth of head	20
Height of ear	15
Height of tragus	2
Width of tragus	2
Length of thigh	18
Length of tibia	13
Length of foot	10
Length of interfemoral membrane	
Length of tail entire	43
Length of tail (free portion)	23

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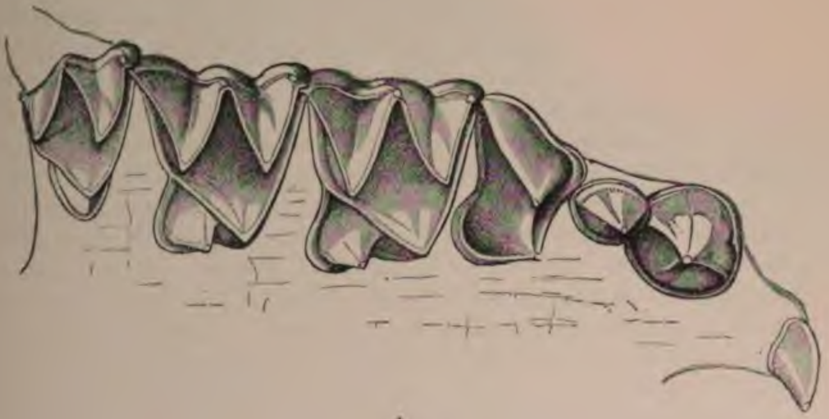
* U. S. Exploring Expedition, Mamm. and Ornith., 1848, 22.



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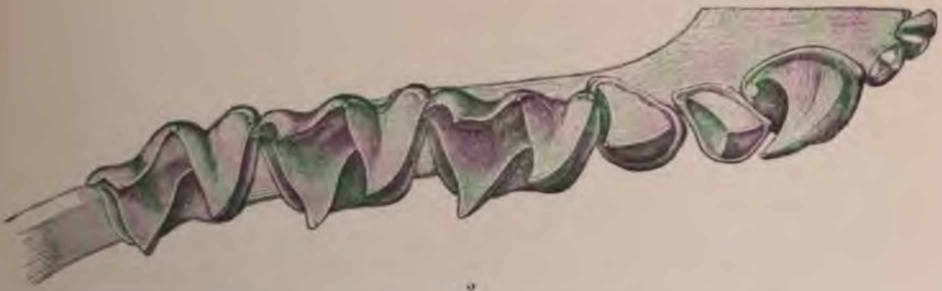

2

1. MAXILLARY TEETH OF NYCTINOMUS MACROTIS NEVADENSIS. X 12.
2. MANDIBULAR TEETH OF SAME. X 12.

Genus PROMOPS Gervais.

Promops Gervais, Exped. du Compte de Castelnau, Zoölogie, Mammifères, 1885, 59, pl. XII, figs. 3, 3a; Peters, MB. Akad. Berlin, 1865, 574.

Dental Formula.—Molars $\frac{3}{3}$, premolars $\frac{2}{2}$, canine $\frac{1}{1}$, incisors $\frac{1}{2} \times 2 = 30$.

Promops was separated by Gervais from *Molossus*, Geoff., on the presence of two premolars in the upper jaw, *Molossus* having but one.

Diagnosis.—The largest bat in the fauna, the forearm measuring $61\frac{1}{2}^{\text{mm.}}$ Ears joined and reach forward quite to the muzzle. Protocone, without the crenulations which are so conspicuous in *Molossus rufus*. The maxillary incisors touch and occupy the intervals between the canines. The first maxillary premolar is small and withdrawn to palatal side of axis of dental series. Anterior V of first molar much smaller than the second. In common with other *Molossi* (excepting *Nyctinomus*), the premaxillæ are conjoined at the palate. The fifth digit is much the smallest of the series, and the first phalanx of the third and fourth digits is dorsiflexed in repose. The first row of phalanges in manus is from three to four times as large as the second. The fifth metacarpal bone is one-half the length of the fourth and nearly one-third the length of the third metacarpal bone.

1. Promops perotis californicus Merriam. (Plates XXXVI, XXXVII, XXXVIII.)

Dr. C. Hart Merriam has described a bat in the fourth fasciculus of the North American Fauna* under the name of *Molossus californicus*.† Two adult females of this bat have been forwarded to me by the National Museum, and upon these the following description has been based. I have long been familiar with a species of *Molossus* which appeared to be a distinct variety, one specimen without locality, which was sent to me by Mr. J. C. Cooper, of the California Academy of Science, and a second purchased of Mr. Ward, also without locality. One of these was in fair condition and more closely answered to the description of *M. glaucinus* than to *M. perotis*, and was identified as *M. glaucinus* var. I have not seen *M. glaucinus*, and held as probable that, as in the case of *Macrotus*, a species of Cuban bat might find closely allied forms in Mexico and California. Were it not for the fact that I have examined *M. waterhousii* from Cuba I would have hesitated in separating *M. californicus* from it. Dobson indeed does not recognize the species last named. Pursuing this plan of reasoning, I declined to describe the Californian specimen as new. Mr. Merriam has been fortunate in securing fully adult forms, which are evidently the same as my *M. glaucinus* var., and has described them under the name above given. He makes no allusion to *M. glaucinus*, but institutes comparisons with *M. perotis*, from which it is undoubtedly distinct. In the absence of exact information respecting *M. glaucinus*, I have concluded to adopt provisionally Mr. Merriam's name as one based upon the study of the adult. Careful comparisons with *M. glaucinus* must be made before its validity is established.

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*N. A. Fauna, 4, 1890–1.

†I have been acquainted with two examples of this species for a long time. One was purchased in a miscellaneous lot, and one sent for examination by the California Academy of Science. Both of these examples were without locality, and I assumed they might be member of faunæ from which I had never received specimens.

M. glaucinus is stated by Dobson to be light brown at the base of the hairs, then chestnut brown, the extreme tips grayish, so that the upper surface appears altogether gray. The colors of *M. californicus* are within the group of the grays, and it is tenable that the basal shade may be variable within specific limits and pass from chestnut to buff and thence to white buff. Be this as it may, the coloration may be discarded in the diagnosis, and the important specific characters made to include the emargination on the posterior border of the auricle (which is said by Dobson to be absent in *M. glaucinus*), the presence of a tubercle on the interauricular membrane, and in the first upper premolar being central in the space between the canine and second premolar.

The tragus in *M. glaucinus*, according to Dobson, is 0.12 ($3\frac{1}{2}^{mm}$), while in *M. californicus* it is 4^{mm}, a difference so slight as to come within the range of personal error.

The difference in the measurements of the body and limbs is not greater than those between specimens of *M. perotis* in the Cambridge collection and those of the British Museum series made by Dobson.

On the dorsum the hair has sooty-ash tips, varying to a light buff or whitish; thus the hair is of two colors. The greater portion is a shade of white. The tips appear to be less differently colored from the shaft over the loin than elsewhere. On the venter the color is lighter, the tips of the hairs are less sooty, but still ashy.

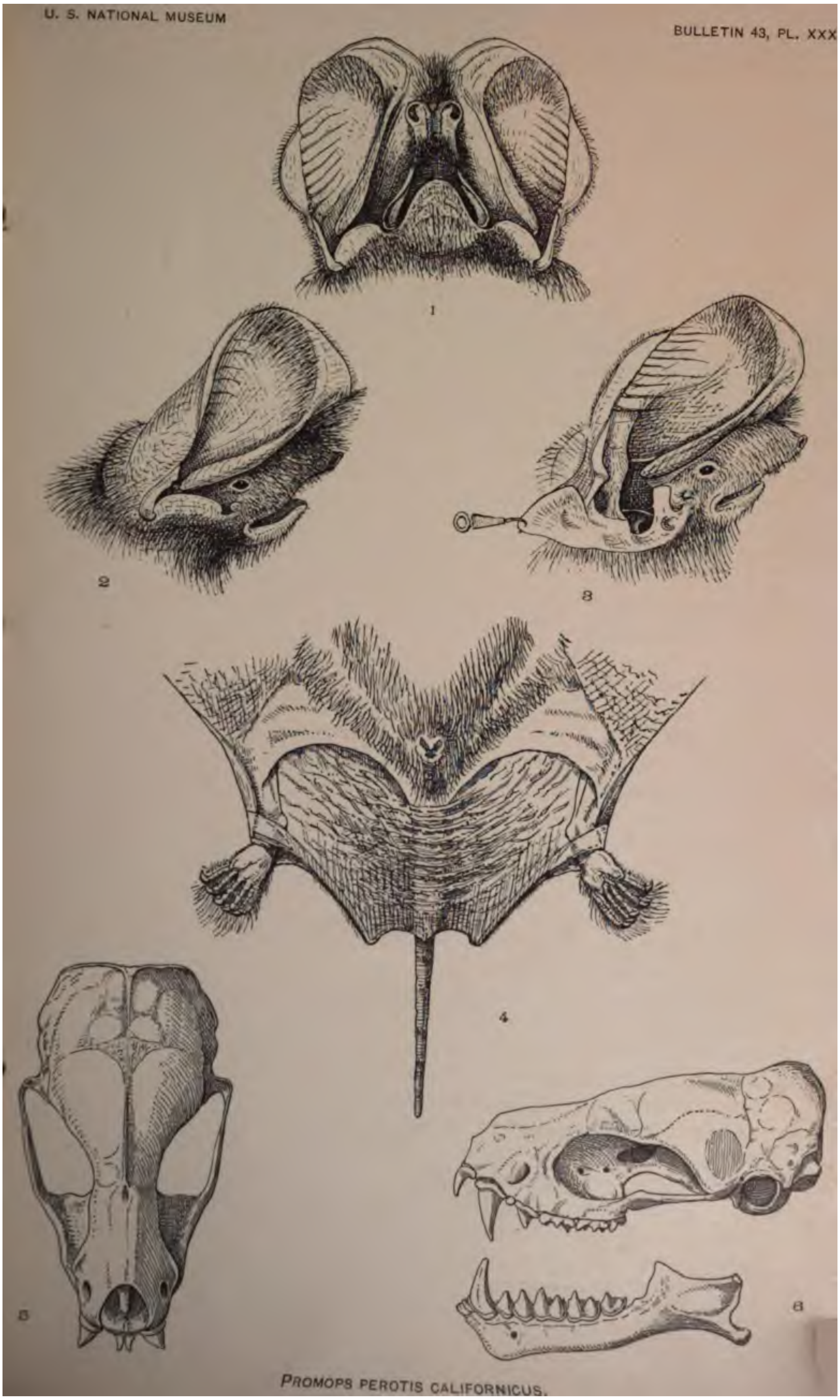
On the membranes the hair covers the basal half of the ear dorsally; it extends from the proximal third of the humerus to near the knee, and on the interfemoral membrane at the basal third. On the venter the hair is about of the same distribution as above, but they do not reach so far along the thigh, and more is found along the forearm.

A thin line of dark unicolored hair is seen along the upper border of the proximal third of the forearm in advance of the elbow; a second much larger line of similar hair extends from the proximal third of the forearm to the wrist, and a white defined patch overlies the carpal portion of the fourth digital interspace.

Membranes.—The prebrachium not volant beyond the junction of the proximal to the middle third of the forearm. The wing membrane is attached to the distal fourth of the leg. No. 19088, U. S. N. M., female, has a rudimentary gular pouch. Auricle ample, one-third longer than head, nearly circular, with a broad, shallow excavation on outer margin; the keel long, nearly reaching the notch, and is slightly folded forward. The hem begins at the posterior emargination, becomes gradually convex, but narrows opposite the external basal ridge, crosses the

EXPLANATION OF PLATE XXXVI.

FIG. 1. Under view of the head of *Promops perotis californicus.*
FIG. 2. Side view of same.
FIG. 3. View of tragus and inner surface of auricle.
FIG. 4. Tail and interfemoral membrane.
FIG. 5. Skull seen from above. x 2.
FIG. 6. Skull and lower jaw seen from the side. x 2.



PROMOPS PEROTIS CALIFORNICUS.

notch, and ends on the posterior border of the antitragus. The antitragus is longer than high. The conch is very deep, almost reaching the shoulder. When the antitragus is removed from its attachments and turned outward the boundaries of the notch and the attachment are distinctly seen. The external basal ridge joins the lowest of the transverse ridges at a right angle. The tragus is longer than wide and is abruptly truncate at the apex. The interauricular membrane is deeply notched in the middle and furnished with a hairy tubercle on either side. A rib connected this membrane to the snout directly back of the muzzle. The muzzle with circular borders which are imperfectly defined below, but trenchant and prorect above, where they are obscurely crenulate. In the median line a vertical ridge separates the almost marginal nostrils. A sparse growth of hairs sparsely lines the upper part of interior of the auricle. A delicate fringe covers the posterior margin, including the hem. The hair of the back of the conch and base of the antitragus can not be distinguished from that of the side of the neck. The interauricular membrane is hairy on both dorsal and ventral surfaces; a moderately stiff brush of forwardly directed hairs project from the rib above the snout.

When the immense range of coloration in some bats is recalled, as for example in *Artibeus perspicillatus*, it is well to be cautious in distinguishing species by shades of fur only.

Skull.—The brain case scarcely elevated above the vertex of the face. Metencephalon slightly higher than the mesencephalon, and this in turn but little higher than the face. A slight depression only between the mesencephalon and the metencephalon. Tympanic bone not concealing cochlea. The otic capsule comes to the periphery at both squamosal bone and occiput. Semicircular canals filled with bone, save the superior, which retains a minute foramen. Anterior temporal ridge faintly marked; sagitta barely defined; posterior temporal ridge trenchant. Face vertex straight. Inner wall of the orbit nearly flat; anterior wall not depressed or with a narrow transverse groove. Anterior nasal spine with flat, thin, lateral process. The infraorbital foramen in front of the second premolar. Squama at base of zygoma is indented.

Distance from infraorbital canal to anterior nasal aperature equals twice the diameter of base of canine. Hard palate extends a short distance beyond the last molar. Lower jaw with semilunar notch exceeding the distance from angle to the condyle. The angle exceeds in length the mesolateral diameter of condyle, and lies below the lower border of the horizontal ramus. The symphysal spine, seen from in front the symphysis menti, is crested at lower half.

The above description contrasts with *Molossus rufus* as follows: The short face vertex is abruptly inclined. The anterior temporal crest not seen, but the posterior crest and the sagitta are very large in many specimens, resembling the parts as seen in *Noctilio*.

[illegible] rbit convex; anterior wall depressed. The anterior nasal aperature with stout blunt process. The infraorbital canal back of the second premolar; the distance from the canal to the anterior nasal aperture equals the width of the base of the canine tooth. The hard palate does not extend beyond the last molar. The lower jaw with semilunar notch equally the distance from the angle to the condyle; the angle exceeds in length the mesolateral diameter of the condyle.

Measurements of skull.

	P. perotis californicus.	*M. rufus.*
	Mm.	*Mm.*
Greatest length	29	22
Length of brain case	17	14
Width of brain case (bimastoid)	15	13
Width of brain case (bizygomatic)	17	14
Width of brain case (bipræncephalic)	5½	4½
Length of face	12	8

The ectoturbinal is compressed from side to side and is one-half the length of the first endoturbinal. The first endoturbinal is acuminate, as it is seen from the median surface, the portion projecting in advance of the third endoturbinal being slightly convex inferiorly. The third endoturbinal is received in a depression on the lateral surface of the first, the second being absent. It in turn receives the fourth. Both these turbinals, as seen in situ, are longer than wide.

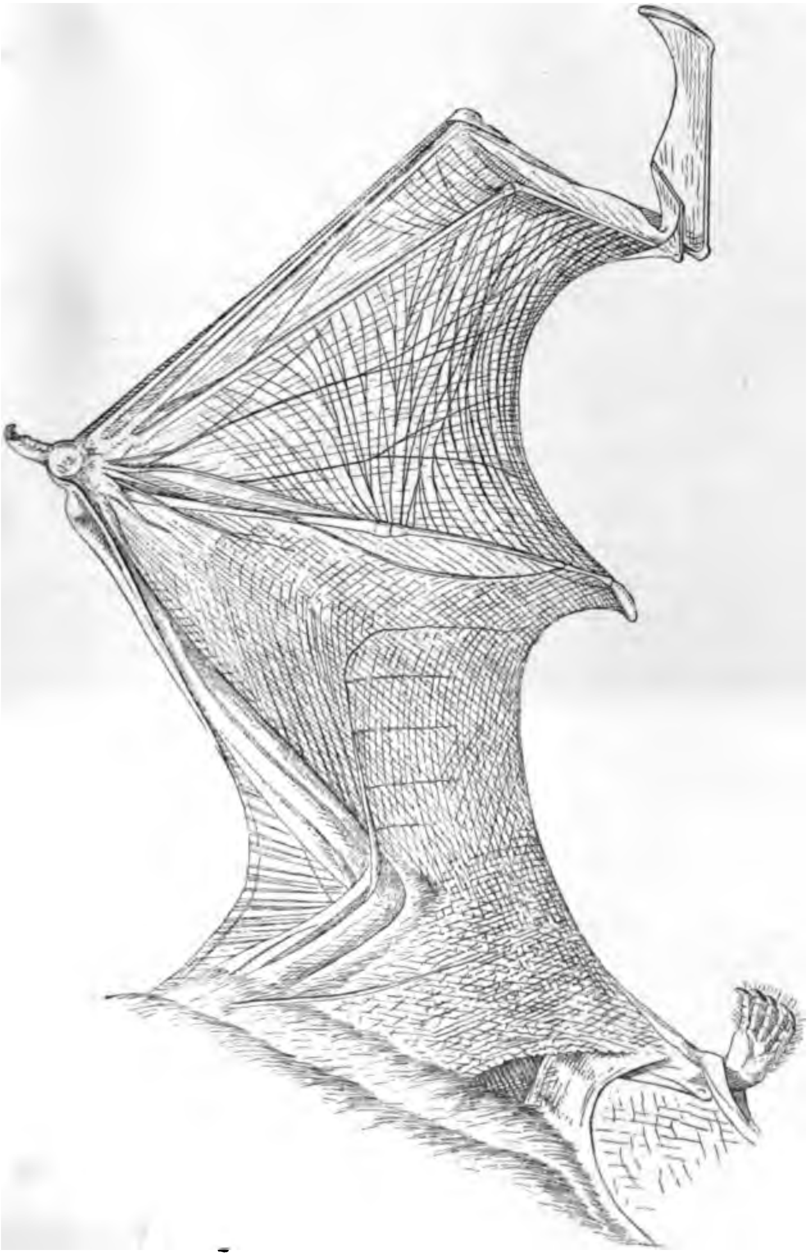
Maxillary teeth.—Incisor almost touches canine, yet reaches middle line and is contiguous with its fellow at the base. The simple, cone-like crown is thence deflected outward, causing the crowns of the two teeth to slightly diverge from one another. Canine simple without groove; the cingulum slightly produced backward. The small first premolar lies directly on the outer face of the interval between the canine and the second premolar. The second premolar with prominent paracone and large heel-like projection. The molars quite as in Nyctinomus, other than that the rudiment of the second V of the third molar is a mere tubercle.

Mandibular teeth.—The incisors are compressed and bilobed. The premolars are slightly crowded. The commissure at the lingual base of the heel is deeply emarginate in the middle. The heel of the third molar is somewhat compressed from without inward, the lingual border being much the higher.

Notes on the skeleton.—Axis with long transverse process, which bears a foramen to the outside of the foramen for the vertebral artery. Keel on the ventral surface of the centrum ending in a tubercle. Atlas with tubercle on anterior arc: large spine on anterior border of wide transverse process. Scapula coracoid deflected posteriorly, narrowed at end.

Humerus.—The height of the outer tuberosity correlates with the depth of the fossa in front of the head. The depression on the humerus, inner side, near elbow, equals one-half diameter of shaft. Trochlear surfaces at elbow

Radius



WING MEMBRANE OF PROMOPS PEROTIS CALIFORNICUS.

The distal end of the radius is furnished with a large median process. Ulna with proximal end not anchylosed to the radius, but having an exceedingly delicate throat-like shaft which joins the radium at junction of middle with the distal, viz., at 45^{mm} the ramius being 72^{mm} long. This is best seen in the young. The distal ulna element is united to the radius, forming with it a perforate quadrate plate which bears a minute perforation. The distal border of the plate is notched.

A sesamoid dorsad to first row of carpal bones; a second sesamoid on the fourth metacarpal, which is united to centrale (or magnum) by a ligament; a third sesamoid on fifth metacarpal at proximal end; it is united to the bones of the first row by a ligament.

Carpus.—The concavo-convex trapezium much larger than the small tripartite trapezoid, and overlapping it. Magnum subcordate unciform with coarsely spinose facet for the fourth metacarpal, but is plain and simple for articulation with the fifth metacarpal. Unciform, small, irregular. Pisiform not extending on shaft of the fifth metacarpal.

Metacarpus with first metacarpal, with axial facet for articulation, with a lateral facet of the second metacarpal. Second metacarpal with a large angulated head which is directed toward the fifth; the fifth metacarpal has a corresponding angulation which is directed toward the second; this arrangement greatly strengthens the palmar aspect of the carpus. The bone is compressed with sharp palmed keel much smaller than any of the series.

The differences in the length of the metacarpal and phalangeal element are seen in the table of measurements.

No keel is seen on the sternum.

Ribs are thirteen in number—the twelfth and thirteenth being widely deflected and having much larger interspaces than the others. The sacrum has three elements.

Innominate with concave dorsum anchylosed to the sacrum and to each other at the pubis.

Femur.—Internal trochanter with minute spine; external trochanter with rugose longitudinal ridge extending on proximal fourth of shaft. The line of top of the external trochanter carried across shaft lies just below head and, if produced, intersects the lower border of the free end of the internal trochanter.

Tibia, with globose spine, posterior surface of shaft near condyle depressed for flexon of toes. Fibula entire; prox end with glocose extremity; distal end the larger, with well-defined malleolus. Clavicle widest to mesal half. A distinct facet is seen for articulating with the first costal cartilage.

Measurements.

	Millimeters.
Head and body (from crown of head to base of tail)	70
Length of arm	35
Length of forearm	67

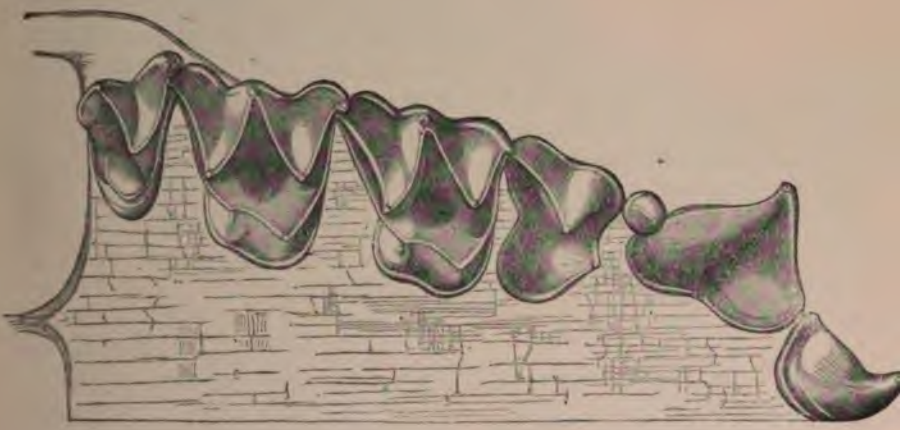
Measurements—Continued.

	Millimeters.
First digit:	
Length of first metacarpal bone	6
Length of first phalanx	6
Second digit:	
Length of second metacarpal bone	67
Length of first phalanx	2
Third digit:	
Length of third metacarpal bone	69
Length of first phalanx	30
Length of second phalanx	26
Fourth digit:	
Length of fourth metacarpal bone	66
Length of first phalanx	23
Length of second phalanx	5½
Fifth digit:	
Length of fifth metacarpal bone	37
Length of first phalanx	21
Length of second phalanx	6
Length of head	29
Height of ear (from lower border of conch)	42
Height of ear (from vertex)	22
Height of tragus	4
Length of thigh	18
Length of tibia	11
Length of foot	11
Length of tail in interfemoral membrane	22
Length of tail beyond the interfemoral membrane	30

The measurements of *P. glaucinus* are here given for convenience. They have been calculated on the metric scale from Dobson's measurements on the English scale.

Measurements.

	Millimeters.
Head and body (from crown of head to base of tail)	76
Length of forearm	61½
Length of first metacarpal bone	11
Third digit:	
Length of third metacarpal bone	61
Length of first phalanx	25
Length of second phalanx	27
Fourth digit:	
Length of fourth metacarpal bone	56
Length of first phalanx	21
Length of second phalanx	6
Fifth digit:	
Length of fifth metacarpal bone	29
Length of first phalanx	21
Length of second phalanx	8
Length of head	29
Height of ear	19
Height of tragus	3½
Length of tibia	16
Length of foot	8
Length of tail	63
Length of tail (free from membrane)	25



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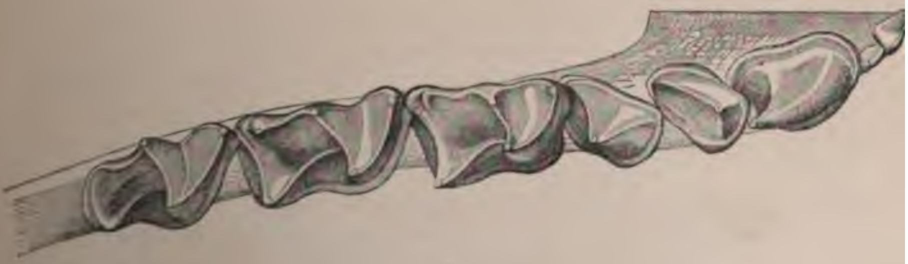

2

1. MAXILLARY TEETH OF PROMOPS PEROTIS CALIFORNICUS. X 8.
2. MANDIBULAR TEETH OF SAME. X 8.

The closely allied *Promops perotis* should be carefully compared with the foregoing subspecies. It presents the following characters:

Ears not as high as broad. Thick at the large keel and in the region of the junction of the keel with the upper base; for the rest, thin and membranous. Hence the ear lies in the head in an irregular mass of folds. The second scallop not easily distinguished from the conch. By careful inspection a small incision is seen to lie on the outer margin at beginning of the ridge of the external basal lobe and the upper margin of the auricle. The second scallop can not be traced beyond the post-antitragus notch. The posterior border of the auricle is without emargination. The keel is much wider than in *P. californicus*. The ransverse auricular line not in the form of ridges. The second scallop does not reach the antitragus, which has the same form as in *P. californicus*. The notch of the interauricular membrane is without tubercles. The snout with less sharp margin and apparently no median vertical ridge. The interauricular membrane with septum 6^{mm} behind muzzle and 6^{mm} in front of skull. Thus, the membrane lies upon the movable snout.

Antitragus twice as long as high; ridge extending forward joining the upper lip in advance of the angle. Keel fleshy, with lower third forming a lobe which is folded backward and touching the rudimental external basal lobe. A conspicuous fringe of short hair grows from conch on line of the keel. The ears are joined by a membrane, which is 3^{mm} high, and lies on the snout directly back of the muzzle. It is folded back, excepting at the median line. This membrane, together with the band for two-thirds of the posterior surface of the auricle, are thickly covered with hair. A fringe of small hairs border the auricle above the second scallop.

The tragus is twice as high as wide; nearly rectangular apex and without basal notch and lobe. The long mobile snout is one-fourth the length of the head. The upper margin of the muzzle is not found by the convex contour line as in *Nyctinomus*, but presents above it a triangular cushion, which is surrounded by long, thick hair, which fills in the interspace between the muzzle and the interauricular membrane. The upper lip is separated from the muzzle by a fringe of hair. The rictus (angle of the mouth) lies in a line with the eye.

The terminal phalanges of the manus are described as follows: Third digit, terminal phalanx compressed laterally; apex slightly expanded, triangular; no membrane on the ectal side. Fourth digit, terminal phalanx slender, aciculate, without free tip, and inclined pollical. Fifth digit, the terminal phalanx is broad, almost spatulate, the proximal half thickened, the endopatagium is attached to the base, and the membrane of the fourth interspace to its tips.

The brain.—The cerebellum is provided with a flocculus. The cerebrum is pyriform, smooth.

Sex differences.—The hair is of a brownish shade, darker in the female than in the male. The base of the hair is pale buff to white. In the female the venter is slightly lighter than the dorsum, but in the male no appreciable difference between the regions exist. The forearm and manus with hair as in *P. perotis californicus*. Although many specimens were available for examination, but one of them, a female, was in good condition. In many the hair had been almost entirely lost, and all the specimens had been semimacerated in weak alcohol, and had been literally churned by transportation on mule back under a tropical sun.

Habitat.—Rio das Velhas, Brazil. Collected by L. Agassiz (Thayer Exped.).

Measurements.

	Millimeters.
Head and body (from crown of head to base of tail)	92
Length of arm	45
Length of forearm	79
First digit:	
Length of first metacarpal bone	5
Length of first phalanx	5
Second digit:	
Length of second metacarpal bone	71
Length of first phalanx	2
Third digit:	
Length of third metacarpal bone	79
Length of first phalanx	33
Length of second phalanx	31
Fourth digit:	
Length of fourth metacarpal bone	75
Length of first phalanx	26
Length of second phalanx	6
Fifth digit:	
Length of fifth metacarpal bone	42
Length of first phalanx	25
Length of second phalanx	7
Length of head	41
Height of ear	27
Height of tragus (posterior surface)	6
Length of thigh	28
Length of tibia	26
Length of foot	14
Length of tail interfemoral membrane	42
Length of tail free from interfemoral membrane	22

Measurements of P. perotis, from Dobson.

	Inches.	Millimeters.
Third metacarpal	3.5	79
First phalanx	1.30	33
Second phalanx	1.20	31
Fourth metacarpal	2.85	2.9
First phalanx	1.5	1.15
Second phalanx	0.25	
Fifth metacarpal	1.70	42
First phalanx	0.90	0.09
Second phalanx	0.25 or 0.35	0.35

Appendix.

In order to enable the student to decide for himself in regard to the many doubtful or unidentified species of authors cited in the foregoing pages, the descriptions themselves are reproduced in the present Appendix.

A.

RAFINESQUE.—American Monthly Magazine, III, 1818, 445.

1. *Vespertilio mystax.* R. (Whisker bat.) Tail two-fifths of total length, upper incisores none, lower 6, 2 warts at the lower jaw, body entirely fallow, top of the head brownish, ears brown, auriculated, longer than the head. Length 5 inches, breadth 14.

2. *Vespertilio humeralis.* R. (Black shoulder bat.) Tail three-sevenths, upper incisores 2, remote, lower 6, body dark brown above, shoulders black, gray beneath, wings, tail, ears and snout blackish, eyes under the hair, ears longer than the head, elliptical, auriculated. Length, 3 1-2 inches, breadth, 11.

3. *Vespertilio tesselatus.* R. (Netted bat.) Tail half of total length, hairy above, upper incisores 2, remote, lower 6, body fallow above, head pale, dirty fulvous beneath, with a faint fallow collar, shoulders white, wings hairy at the base, with 2 hairy white spots above near the thumb, membrane blackish, netted of fulvous internally and clotted of same externally, shafts fulvous, nose bilobate, ears nearly concealed by the hair. Length 4 inches, breadth 12.

4. *Vespertilio cyanopterus.* R. (Blue-wing bat.) Tail one-third, 2 incisores above, 6 beneath, body dark gray above, bluish gray beneath, wings of a dark bluish gray, shafts black, ears auriculated, longer than the head. Length 3 inches, breadth 10.

5. *Vespertilio melanotus.* R. (Black back bat.) Tail one-third, brown above, gray beneath, body blackish above, whitish beneath, wings dark gray, shafts black, ears auriculated, rounded. Length 4 1-2 inches, breadth 12 1-2.

6. *Vespertilio calcaratus.* R. (Spurred bat.) Tail one-third, body dark brown above, dark fallow beneath, wings black, shafts rose-coloured, a spur at the inner side of the elbow, hind feet black. Length 4 inches, breadth 12.

7. *Vespertilio monachus.* R. (Monk bat.) Tail one-fourth, hairy above, fringed laterally, body pale, fallow above and below, head and neck covered with a longer fur of a dark red fallow, wings dark gray, shafts red, hind feet black, nose red, ears concealed in the fur. Length 4 inches, breadth 12.

8. *Vespertilio phaiops.* R. (Black faced bat.) Tail one-third of total length, naked, mucronate, body dusky bay above, pale beneath, face, ears and wings blackish, 4 incisores in the upper jaw, 2 on each side, divided by a large flat wart, unequal, the outside ones larger and bilobed, 6 small incisores at the lower jaw. Length 4 1-2 inches, breadth 13.

9. *Vespertilio megalotis.* R. (Big-eared bat.) Tail three-eighths of total length, body dark gray above, pale gray beneath, ears very large, duplicated, auricules nearly as long. Length 4 inches, breadth 12 inches.

B.

RAFINESQUE.—Annals of Nature, 1820, 2, 3.

1. N. sp. *Atalapha fuscata.* Ears longer than the head, auriculated and blackish; tail three-sevenths of total length, jutting only by an obtuse point; body brownish above, grayish beneath; shoulders and cheeks dark brown; hind feet blackish, hairy above; wings blackish brown. Found in the northern parts of the state of New York and in Vermont. Total length three and an half inches. My genus *Atalapha* (Prec. dec.) contain all the Bats without fore teeth; there are 3 or 4 species of them in the United States all blended under the name of *Vespertilio* (*or Noctilio*) *noveboracensis* by the writers.

I. N. G. EPTESICUS. Four acute fore-teeth to the upper jaw, in two equal pairs, separated by a great interval and a large flat wart, each pair has two unequal teeth, the outside tooth is much larger and unequally bifid, the outside one much larger, inside tooth small and entire. Six fore-teeth to the lower jaw, equal very small, close and truncate. Canine teeth very sharp, curved and long. Grinders unequally trifid. Snout plain, nose without appendages. Ears separated, auriculated. Tail mucronate.—This genus appears to differ from all those of Geoffroy and Cuvier, among the extensive tribe of Bats. The name means house-flyer.

2. *Eptesicus melanops.* Fallowish brown above, pale beneath, face, ears, wings, feet and tail blackish; ears oval, shorter than the head and wrinkled; tail naked, one-third of total length, mucrone one-sixth of the tail; posterior toes ciliate.—Not uncommon in Kentucky, Indiana, &c., total length, four and an half inches. I had noticed it under the head of *Vespertilio phaiops*, in the American Magazine, vol. 3d. It comes often in the house at night.

3. *Eptesicus mydas.* Fulvous above, grey beneath; wings, ears and tail, pale brown, shafts whitish; ears double the length of the head; tail naked, slightly mucronate, nearly as long as the body.—I have observed it in the barrens of Kentucky flying in the houses. Total length three inches, of which the tail includes five-twelfths. Ears three-quarters of an inch long. I mentioned it under the name of *Vesp. midas* in my account of the Bats of the Western States, (Am. Mag. v. 3). I have since instituted two other genera with them, *Hypexodon* and *Nycticeius* (Prodr. 70 N. G. An); the others are probably Atalaphes. I know already fifteen species of Bats in the United States, almost all new ones.

C.

LECONTE.—Cuvier's Animal Kingdom (McMurtrie's ed.), 1831, 431

I.

Vespertilio carolinensis, GEOFF. Anterior upper fore-teeth sub-simple, larger than the posterior. Remarkable for a strong odour resembling that of a Fox.

V. lucifugus, L. C.—Anterior upper fore-teeth bilobate; body above dark brown, beneath cinereous; nose sub-bilobate; face with a nakedish prominence on each side; ears oblong, naked, tragus sublinear, half as long as the ears; tail projecting a little beyond the membrane; length to the insertion of the tail, two inches and a quarter; tail, one inch and a quarter.

V. noctivagans, L. C. Anterior upper fore-teeth bilobate, the posterior sub-simple; colour black or dusty cinereous; hair on the back and belly tipped with grey; ears short, naked, roundish; tragus short and roundish; nose sub-bilobate; tail projecting a little beyond the interfemoral membrane, which is hairy; length two inches and five eighths; tail one and three eighths.

II.

Add *Plecotus macrotis*, L.C. Upper fore teeth four, trilobate, distant by pairs, the posterior smaller; ears v[illegible] pointing forwards; tragus subulate, half the length of the ears. (There is [illegible] with equally long ears, which are not united on the cra[illegible] *[illegible]lotis*, of Raffin., it is impossible to say.)

III.

Nyct. noreboracensis. Easily known by its short and round ears, and by the interfemoral membrane being hairy and including the whole of the tail. There is a white spot at the insertion of the wing, and another at the base of the thumb; these marks are constant. This species varies much in colour, and has been called *V. lasiurus,* Schreber, *V. monachus* by some, and is figured Wils. Orn. VI, pl. 4, whence it has been quoted by M. Cuvier as the *Taphozöus.*

Nyct. crepuscularis, L. C. Above brown, beneath paler; a small black wart above each eye; nose somewhat bilobate; chin with a small double wart; ears moderate; tragus small, subulate; tail projecting a little beyond the membrane.

Nyct. cynocephala, L. C. The posterior fore tooth on each side smaller than the rest which are emarginate; nose furnished on the top and sides with stiff short bristles; lips very large, somewhat pendulous; ears broad, round, naked; tragus not apparent; tail long, extending far beyond the membrane; outer and inner toes of the hind feet wooly on the outside; the rest with each two long hairs on the top.

D.

PALISOT DE BEAUVOIS.—Description of *Atalapha cinereus* and *Adelonycteris fuscus.* (From Pamphlet.)

Gray Bat.—Two upper teeth very small, hardly visible. Head whitish; ears round and flat, of a white color surrounded with black, and an appendage at their base; hair gray at the roots, black in the middle, and white at the ends, so that the animal has the appearance of being spotted with white. The hair extends to the membrane which surrounds the tail.

"The anterior parts of the membranous wings from the body of the projecting claw and covered with hair on both sides. This membrane is about twice the size of that in the preceding species" (*L. noveboracensis* Auct.). "The wings, extended, measure 14 inches. The nostrils are emarginated.

"Gray Bat. *V. cinereus.*

"This is found in Pennsylvania, and is not described by any author."

"*Brown Bat.*—The two fore teeth in the upper jaw distant from one another, near the canine teeth, and about half their length; ears naked, blackish, and of an oval figure, with an appendage at their base. Tail almost as long as body; flying membrane black; hair brown on the surface, gray below.

"Brown Bat. *V. fuscus.*

"This is the most common species in the neighborhood of Philadelphia. It very much resembles the Common Bat of France, except in the number of teeth in the upper jaw."

E.

TEMMINCK.—Monographies de Mammalogie, II, 1835, 235.*

V. ursinus. (A new species kindly furnished me by Prince Max; it is based upon the examination of seven individuals.)—Head large; muzzle rather long, large, and but little depressed; nostrils large, opening upon the side and crescentic—separated by a groove. Ears ovoid, much higher than the summit of the head, the posterior border vertical, and slightly emarginated at the tip; tragus long, lanceolate, but a little rounded near the tip; the auricle is hairy at the base of the external part; the thumb stout, armed by a very curved nail; tail long, point free; interfemoral membrane marked beneath with parallel lines; claws of feet very long, stout, and curved. Incisor teeth above in two close pairs; below 6, trilobed. Molars above 4, without false; inferior with 5, one being a small false molar.

Fur long, soft, and shining; above of a brown umber hue, the inferior parts more clear. All the fur is gray at the base. Membranes and ear black.

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*Translation with emendations in "Monograph of Bats of North America," Allen, 1864.

Length, 3 inches 11 lines, the tail taking 1½ inches; length of ear, 4½ lines; expanse of wing membrane, 10 inches 9 lines.

Hab.—Found by Prince Max upon the banks of Missouri River.

V. carolinensis.—Not so large as *V. serotinus* of Europe. Ears as long as the head, oblong, and hairy one-half the length of the external part of ears. Nose a little blunt, but nostrils approached; tragus leaf-shaped, erect, and half as long as the auricle; point of the tail free. Incisors 4, in pairs above, and 6 below. Molars 5 throughout.

Fur bicolored throughout; superior part of a brown "marron," but the base of the hair is ashy black; beneath of a yellow ash, the base of the hair being brown.

Total length, 2, 3, or 5 inches, of which the tail constitutes 1 inch; expanse, 10 inches.

Hab.—Charleston, S. C.

V. phaiops.—The general contour like that of *V. murinus*. Point of tail free; tail not so long, strongly "sloped" out on external border, with a lobe cut out behind. Tragus an erect leaf. Superior incisors, 4; the external are bilobed, and are larger than the internal. Inferior, 6. Molars, 4 above and 5 below.

Hair short and unicolored throughout, glossy, above brown, with a tinge of red, below it is of clearer hue; face and membranes blackish.

Length, 4 inches 4 lines, or 5 inches, the tail being 2 inches; expanse of wing membrane, 12 to 13 inches; antibrachium, 1 inch 8 lines.

This is the Black-faced Bat of Rafinesque, of which there is mention made in Desm. Mam. in a note.

Hab.—North America; our animal comes from Tennessee.

V. pulverulentus.—Resembles, in the color of the superior fur, *V. discolor*, but differs from it in its lesser size, in the interfemoral being hairy on both sides, and in the difference of color of the belly. Muzzle large and obtuse; ears larger than high, rounded, one-half haired; tragus hatchet-shaped; tail short; interfemoral very hairy above, but less at the point than at the base, that beneath of a clear "voie," and in concentric lines; the toes furred above.

Fur long, soft, bicolored throughout; the superior and inferior parts are of the same color. It is of a deep marron, the point only being touched with white, the hairs "clair sermes," arranged in horizontal lines upon the inferior part of the interfemoral membrane, are white.

Length, 3 inches 6 lines, of which the tail is 1 inch 3 lines; expanse, 10 inches; antibrachium, 1 inch 6 lines.

This species was furnished us by Prince Max Wied, who obtained it in the mountain recesses of North America. Ours come from the borders of Missouri.

V. caroli.—Tail the form of our *V. pipistrellus*, but the ears are longer. Face obtuse; nostrils very much separated; ears are of medium size, ovoid, slightly emarginate on their external border without having a lobe or prolongation. Upper incisors 4, in pairs above and 6 below. Molars, 6 in all; the two first false molars of the upper jaw very small, short, and pointed. Fur bicolored throughout. Face, sides of neck, and all of the superior part of a reddish brown, with black at the base; beneath of a yellowish-white at the point, with a deep brown at base, which in some parts is of a faint yellowish-ash. The young have a more somber hue. The extreme tip only of the superior parts is brown; that of the inferior is of a deep brown.

Total length, 3 inches 3 lines, the tail of which is 1 inch and 4 lines; expanse of wing membrane, 8 inches 6 lines; antibrachium, 1 inch 4 lines; height of ear from skull to the tip, 5 lines. The young have an expanse of 7 inches 10 lines to 8 inches.

The Museum has obtained from Prince de Musignano (Charles Bonaparte) many individuals of this species.

Hab.—North America, around the environs of New York and Philadelphia.

V. erythrodactylus.—Less than the *V. pipistrellus.* The forearm, base of fingers, and the interdigital membrane of the first finger is reddish, the other membranes are black. Ears haired from their base the greater portion of their height, small, ovoidal. Tragus, subulate; tail very long, point free; interfemoral membrane haired above; beneath the hairs are arranged along the veins; it is of a silky texture, very short, and sparingly distributed. Incisors, 4, in pairs above and 6 below. Five molars in all; only one false molar in the upper jaw.

Fur long, fine, and silky; above tricolored, beneath bicolored. All the superior parts of a faint brownish red, but a little yellow about the head and neck; the hairs are black at their base, afterwards yellow, and the tip brownish red, superior part of interfemoral membrane very furry; beneath brown at base and brownish red at tip; the sides of the interfemoral covered with sparse hairs.

Length of tail, 2 inches 10 lines, or 3 inches maximum, that of tail 1 inch 4 lines; forearm, 1 inch 2 lines; expanse of wing membrane, 7 inches 6 lines, or 8 inches maximum.

The Museum du Pays Bas possesses many individuals of this supposed new species, for which we are indebted to Prince de Musignano; these specimens are preserved in alcohol, and are part of the same invoice as the preceding species. *Vesp. calcaratus*, indicated by M. Rafinesque, has the wing membranes about the fingers red above; but it is much larger and the coloration of the fur is considerably different.

Hab.—North America, about the environs of Philadelphia.

V. ferrugineus.—Style of *V. daubentonii*, of Europe. Nose short, obtuse; ears narrow, a little scooped out on the posterior border and towards the tip; tragus short, subulate. Tail very long, point free, the basal portion covered with hair; the claws of the hind feet are of a whitish yellow. Upper incisors 4, in pairs, internal long "biseam" at point; the external short, bifurcated; inferior incisors 6. Upper molars 4; lower 5, with one false molar.

Hair short, smooth, bicolored; above the color of a dead leaf, or more or less reddish; the base of the hair is of a brownish black beneath; all the hair at its base is of a faint blackish red, and the point pure white. These two hues of the hair form a sort of black and white mixture which is very conspicuous. The membranes of the ears, having been immersed in alcohol, are of a brownish red.

Total length, 4 inches or 2 lines longer, that of the tail 1 inch 9 lines; humerus, 1 inch; forearm, 1 inch 8 lines; anal expanse, 10 inches, or 6 lines longer.

This species, based upon the examination of many alcoholic specimens, is new.

Hab. Holland, Guiana. (Museum *Pays Bas:* from the environs of Surinam.)

F.

Say.—Long's Expedition to the Rocky Mountains, II, 1823, 65, note.

Vespertilio subulatus.—A small bat was shot this evening, during the twilight, as it flew rapidly in various directions over the surface of the creek. It appears to be an immature specimen, as the molars are remarkably long and acute; the canines are very much incurved, and the right inferior one is singularly bifid at tip, the divisions resembling short bristles. This species is beyond a doubt distinct from the Carolina bat (*V. caroliniana*, Geoff.), with which the ears are proportionally equally elongated, and, as in that bat, a little ventricose on the anterior edge, so as almost to extend over the eye, but the tragus is much longer, narrower, and more acute, resembling that of *V. emarginatus*, Geoff., as well in form as in proportion to the length of the ear. We call it *V. subulatus*, and it may be thus described—Ears longer than broad, nearly as long as the head, hairy on the basal half, a little ventricose on the anterior edge, and extending near to the eye; tragus elongated, subulate; the hair above blackish at base, tip dull cinereous; the interfemoral membrane hairy at base, the hairs unicoloured, and a few also scattered over its surface and along its edge, as well as that of the brachial membrane; hair beneath black, the tip yellowish-white; hind feet rather long, a few setæ extending over the nails; only a minute portion of the tail protrudes beyond the membrane.

Total length, 2 9-10 inches; tail, 1 1-5 inches.

Vespertilio arquatus.—Head large; ears rather shorter than the head, wide, and at tip, rounded, hairy at base, posterior edge with two slight and very obtuse emarginations; the anterior base distant from the eye; tragus arquated, obtuse at tip; interfemoral membrane naked, including the tail to one-half of the penultimate joint. Total length, 5 inches; tail, 1 1-2 inches; expansion more than 13 inches.

Resembles *V. fuscus* in color, but larger. Ears broader and proportionally shorter, and an arquated tragus curving in an almost luniform manner towards the anterior portion of the ear, like that of *V. serotinus*. [Description abbreviated from Say.]

Council Bluffs (Iowa). Say, Long's Expedition to Rocky Mountains, 1823, I, 167.

G.

Fr. Cuvier.[*]—Nouv. Annales du Museum d'Histoire Naturelle, Paris, 1832, 15.[†]

1. *Vespertilio gryphus.*—The head is like that of the *Murinoid* group of bats, to the molars proper of which is united two additional false molars on both sides of either jaw. The ear is emarginated, and the tragus is knife-shaped. All the superior parts of the body are of a whitish yellow, the inferior parts are gray, but the base of the fur on both sides is of a blackish color. Whiskers are present on each side of the upper lip and on the extremity of the lower jaw.

Length of body, from the tip of nose to base of tail, 1 inch 9 lines; length of tail, 1 inch 7 lines; expanse of wing membranes, 7 inches 10 lines.

Hab.—Environs of New York. (M. Milbert.)

2. *V. Salarii.*—The head is like that of the *Murinoid* group of bats, to the molars proper of which is united the presence of two false molars on both sides of either jaw. The ear is emarginate, and the tragus lanceolate. The superior parts of the body are of a brown chestnut-gray, and the inferior parts a grayish white. There is more of the brown color at the basal portion of the fur than at the upper. Whiskers are present on the sides of the upper lip and at the extremity of the lower jaw.

Length of body, from tip of nose to the base of tail, 1 inch 6 lines; length of tail, 1 inch 7 lines; expanse of wing membranes, 7 inches 7 lines.

Hab.—Environs of New York. (M. Milbert.)

3. *V. creeks.*—The head of the *Serotinoid* group of bats. No false molars on upper jaw, and one only inferiorly; the ear is emarginate, the tragus lanceolate; the upper parts are of a brown yellow, the inferior parts of a dirty gray; the hairs of all the parts are black at their base. Whiskers are present on the sides of the muzzle and beneath upon the lower jaw.

Length of body, from tip of nose to the base of the tail, 2 inches; length of tail, 1 inch; expanse of wing membranes, 9 inches.

Hab.—Georgia. (Maj. Leconte.)

4. *V. crassus.*—The head is like that of the *Murinoid* group of bats. Two false molars on each side of the two jaws; the ears are obtuse, the tragus is lanceolate. All the superior parts of the body of a brown chestnut-gray, and the inferior parts whitish; the fur at its base is darker tinted than its tips. Moustaches are present on the upper lip and upon the lower jaw.

Length of body, from tip of nose to base of tail, 2 inches; length of tail, 1 inch 8 lines; expanse of wing membrances, 8 inches 8 lines.

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[*] M. Cuvier designated by the term "*Murinoid group*" those species of Chiroptera since placed under the genus *Vespertilio*. In the "*Serotinoid group*" he placed those species now included in *Scotophilus*. The names are taken respectively from two well-known European species—*V. murinus* and *V. serotinus*.

[†] Translation with emendations in "Monograph of Bats of North America," Allen, 1864.

This species was collected by M. Leseuer, who sent it from New York, under the name which I have retained.

5. *V. georgianus.*—The head is like that of the *Murinoid* group of bats. The ear is emarginate, and the tragus is subulate. All the superior parts of the body are colored by a mixture of black and whitish yellow; the black mostly, inasmuch as the points of the hair are whitish, the remainder being black. The inferior parts are gray, but mixed with black from the same cause which colors the superior portions. Mustaches are present on the sides of the upper lips and upon the lower jaw.

Length of body, from tip of nose to base of tail, 1 inch, 6 lines; length of tail, 1 inch 2 lines; expanse of wing membrances, 7 inches 2 lines.

Hab.—Georgia. (Maj. Leconte.)

6. *V. subflavus.*—The head is like that of the *Murinoid* group of bats. The ear is emarginated, the tragus is half heart-shaped. The inferior parts of the body are of a clear whitish-gray, slightly waved with brown; the superior parts are of a white yellow; the hairs of the superior parts are black at their base, whitish through the greater part of their length, and brownish at their tips; that of the inferior parts are black at their basal portions, and of a whitish yellow at their outer. Mustaches are present on the sides of the upper lip and beneath upon the lower jaw.

Length of body, from tip of nose to the base of the tail, 1 inch 6 lines; length of the tail, 1 inch 3 lines; expanse of wing membranes, 7 inches 2 lines.

Hab.—Georgia. (Maj. Leconte.)

H.

AUDUBON and BACHMAN.—Journal, Academy of Natural Science Philadelphia, 1842, 280.

Vespertilio monticola (Mountain bat).—V. vespertilione subulata brevior; auriculus brevioribus; tragus nonexcedentibus, dimidiam longitudinem auriculæ; colore fulvo.

Mountain Bat.—Smaller than Say's Bat (*V. subulatus*); ears shorter; tragus, less than half the length of the ear; color, yellowish brown. Upper fore teeth bilobate, ears moderate, naked, erect, rather broad at base; tragus linear, subulate, body small; wings long; tail projecting a line beyond the interfemoral membrane, which is slightly sprinkled with hair above and beneath.

Color.—The nose and chin are black; ears light brown; wing membranes dark brown. The whole of the fur of the body, above and beneath, is from the roots, of an uniform yellowish-brown color.

The species differs from Say's Bat, not only in color, but in the much shorter ears and tragus. The size and shape of the tragus we have found an invaluable guide in our American bats; the ears of the present species, when alive, are always erect; whilst those of Say's Bat are folded backwards like those of the long-eared Bats—*Plecotus.*

Dentition.—Incisors $\frac{2-2}{6}$. Canines $\frac{1-1}{1-1}$.

Dimensions.—Length of head and body, 1 inch 8 lines; length of tail, 1 inch 6 lines; length of spread, 8 inches; height of ear posteriorly, 3 lines; height of tragus, 1¼ lines.

N. B.—The tragus in Say's Bat is four-and-a-half lines in height. Several specimens of this Bat were obtained during the summer, on the mountains of Virginia, at the Grey Sulphur Springs. They were uniform in size and color.

Vespertilio virginianus (Virginian bat).—V. vespertilione monticolâ paululum longior, auriculus paululum longioribus magisque acutis; dentibus primoribus maxillæ superioris simplicibus; interfemorali membranâ nudâ; corpore supra fuligineo-fusco; subtus cinereo-fuscato.

Virginian bat.—A little larger than the Mountain Bat; ears a little longer and more pointed; upper fore teeth simple; interfemoral membrane naked; sooty brown above, ash brown beneath.

Dentition.—Incisors $\frac{2-2}{6}$. Canines $\frac{1-1}{1-1}$.

In size this species is intermediate between *V. carolinensis* and *V. subulatus*. The ear is naked, less rounded, and more pointed than either of the other closely allied species. The tragus is very narrow, linear, and less than half the length of the ear. The tail is inclosed in the interfemoral membrane, except the penultimate joint, which is free. The anterior upper fore teeth, instead of being sub-simple, as in the *V. carolinensis*, or bilobate, as in *V. subulatus* and *V. montanus*, are simple.

Color.—The nose, upper lip and upper jaw are black; wings dark brown. The back is sooty brown; on each shoulder, at the insertion of the wing, there is a circular black spot about 4 lines in diameter; on the under surface cinerious brown.

Dimensions.—Length of head and body, 2 inches 5 lines; length of tail, 1 inch; length of spread, 8 inches 8 lines; height of ear posteriorly, 4 lines; height of tragus, 1¾ lines.

Hab.—Mountains of Virginia.

V. leibii (Leib's bat).—V. supra fusco-ferrugineus, subtus cinereus, alis auribusque nigris.

Leib's bat.—Ears and wings black; dark yellowish brown above; cinereous beneath.

Description.—Anterior upper fore teeth bilobate; head short; nose blunt; ears moderate, broad at base, erect; tragus linear, nearly half the length of the ear; wings and tail long, the latter extending two lines beyond the interfemoral membrane, which is naked; feet very small; toes short and slender; nails sharp and much curved; hair soft and downy.

Color.—The ears, wings, and interfemoral membrane are black. The fur on the back is black from the roots to near the extremities, where it is so slightly tipped with light brown as to give it a dark-yellowish brown appearance. On the under surface the hairs are plumbeous at the roots, tipped with yellowish white.

Dentition.—Incisors $\frac{2-2}{6}$. Canines $\frac{1-1}{1-1}$.

Dimensions.—Length of head and body, 1 inch 7 lines; length of tail, 1 inch 4 lines; length of spread, 7 inches; height of ear posteriorly, 2½ lines; height of tragus, 1 line

Hab.—Michigan.

V. californicus (Californian bat).—V. fusco lutescens, vellere longo et molli; trago longitudine dimidium auris excedente.

Californian bat.—With long silky hairs; tragus more than half the length of the ear; color light yellowish brown.

Description.—Anterior upper fore teeth bilobate. Head small; nose sharp; ears of moderate size; erect, rather narrow, and pointed. Tragus linear, attenuated. Wings of moderate length, which together with the ears are naked. Interfemoral membrane with a few scattered hairs; feet small; nails slightly hooked. Tail projecting a little beyond the interfemoral membrane.

Color.—The pelage, which is unusually long for the size of the body, and very soft and glossy, is, on the upper surface, dark plumbeous from the base, and broadly tipt with light yellowish brown; on the under surface the color is a little darker, owing to the outer extremities of the hairs being more narrowly edged with the prevailing color on the back, exhibiting the darker shades beneath. The ears and tragus are blackish—the nose, chin, wings, and interfemoral membrane dark brown.

Hab.—We have obtained but a single specimen, which was captured at California.

Dentition.—Incisors $\frac{2-2}{6}$. Canines $\frac{1-1}{1-1}$.

Dimensions.—Length of head and body, 1 inch 7 lines; length of tail, 1 inch 5 lines; length of spread, 7 inches 6 lines; height of ear posteriorly, 3 lines; height of tragus, 2 lines.

I.

PRINCE MAXIMILLIAN VON WIED—Verzeich. beobach. Säugethiere in Nord Amerika, 1862, 19.*

Vespertilio brevirostris.—Description: Head very short; snout broad, and but little produced; ear tolerably high, rather elliptical, the anterior border somewhat rounded, the outer nearly straight, under the tip slightly emarginated; tragus rather small, nearly lancet-shaped; the fur about the head very plentiful, so that the eyes are entirely hidden.

Dentition.—The specimen of this bat is lost, so I can not therefore furnish the dentition.

The expansion of the wings rather small. Thumbs long and small, with greatly curved nails. Tail somewhat long, eight or nine joints lying on the outer half of the fur of the interfemoral membrane, the tip, however, is one and a half to two lines long, with the free points exserted; the five hind toes are long, the nails weak, and sharply curved; calcaneum rather long; fur thick about the belly, mouse-like, that of the back longer; wing membranes near the body are somewhat furred.

Coloration.—Expansion of wing membranes and ears are dark brown; upper portion of the body dark yellowish-brown, the hair on the outer half fallow yellowish-brown, dark gray at the roots; under portion whitish yellow-gray.

Measurements.—Entire length, 3 inches; expanse of wing membrane, 9 inches 4 lines; height of ears on the upper side 5½ lines; length of the exposed portion of the tragus, 1⅛ lines; the tail is free from the fur about 1 inch 5 lines; length of calcaneum, 5 lines.

I obtained this bat at Freiburg, Pa., about the latter part of July. It flies about rather early in the morning. We have observed that this bat resembles the other species closely, but it is readily distinguished by the shortness of the head, as the name given to it implies.

J.

ÉTIENNE GEOFFROY ST. HILAIRE. Annales du Muséum D'Histoire Naturelle, Paris, VIII, 1806, p. 204.

Vespertilio albescens.—Le vespertillon poudré à l'oreille haute de 14 millimètres et de même forme que celle du V. très velu; son oreillon est de même subulé, et son pelage noirâtre en dessus et brun-obscur en dessous: il paroît comme poudré de blanc sous le ventre, parce que les pointes de chaque poil sont de cette couleur. La teinte blanche gagne de plus en plus en arrière. Ce vespertilion est la chauve-souris douzième ou la chauve-souris brune-obscure de M. d'Azzara. Il en rapporte ainsi les dimensions: longuer totale 80 millimètres; de la queue, 33, de l'envergure, 235.

[No locality is given but the statement is made that the specimen was procured by M. d'Azzara and an inference can be drawn from this fact that the type of *V. albescens* in South America.]

K.

DOBSON.—Annals and Magazine of Natural History (1886) XVIII, 124.

Vesperugo Merriami.—The following is an abstract of Mr. Dobson's original article. *V. merriami* Dobson (Ann. and Mag., N. H., 1886, XVIII, 124), outer margin of ear less deeply emarginate than in *V. pipistrellus*, projecting part of the lower half outer margin folded backward; tragus broad, outer side upper half even convex even to broad tip. Internal margin concave, at base of outer margin a longitudinally directed lappet is seen; post calcaneal lobule shallow, extreme tip of tail alone exsert. Color, pale yellowish brown on both surfaces, paler beneath, basal half or more of the hairs dusky.

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*Translation in "Monograph of Bats of North America," Allen, 1864.

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of *V. hesperus* and another specimen of the same (No. 15981) in hand, I find that the latter agree perfectly with the former. I have no doubt, therefore, that *V. merriami* must be regarded as identical with *V. hesperus* (Allen).

The locality given by Dr. Dobson (Locust Grove, N. Y.) is incorrect. The species is resident in the extreme southwestern section of the United States. Dr. Allen's specimens, as already stated, were from Posa Creek and Fort Yuma, Cal. Another specimen recently acquired by the National Museum (No. 15981), and referred to above, is from Whitewater, San Diego County, in the same State.

U. S. National Museum, *November* 21, 1887.

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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 44.

CATALOGUE OF THE LEPIDOPTEROUS SUPERFAMILY NOCTUIDÆ FOUND IN BOREAL AMERICA.

BY

JOHN B. SMITH, Sc. D.,
PROFESSOR OF ENTOMOLOGY IN RUTGERS COLLEGE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

ADVERTISEMENT.

This work (Bulletin No. 44) is one of a series of papers intended to illustrate the collections belonging to the United States, and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

The publications of the National Museum consist of two series—the Bulletin, of which this is No. 44, in continuous series, and the Proceedings, of which the sixteenth volume is now in press. A small edition of each paper in the Proceedings is distributed in pamphlet form to specialists in advance of the publication of the bound volume.

The Bulletin of the National Museum, the publication of which was commenced in 1875, consists of elaborate papers based upon the collections of the Museum, reports of expeditions, etc., while the Proceedings facilitate the prompt publication of freshly-acquired facts relating to biology, anthropology, and geology, descriptions of restricted groups of animals and plants, the discussion of particular questions relative to the synonymy of species, and the diaries of minor expeditions.

Other papers, of more general popular interest, are printed in the Appendix to the Annual Report.

Full lists of the publications of the Museum may be found in the current catalogues of the publications of the Smithsonian Institution.

Papers intended for publication in the Proceedings and Bulletin of the National Museum are referred to the Committee on Publications, composed as follows: T. H. Bean (chairman), A. Howard Clark, R. E. Earll, Otis T. Mason, Leonhard Stejneger, Frederick W. True, and Lester F. Ward

S. P. LANGLEY,
Secretary of the Smithsonian Instiution.

WASHINGTON, D. C., *July 5, 1893.*

A CATALOGUE,

BIBLIOGRAPHICAL AND SYNONYMICAL,

OF THE SPECIES OF MOTHS OF THE

LEPIDOPTEROUS SUPERFAMILY NOCTUIDÆ,

FOUND IN

BOREAL AMERICA.

WITH CRITICAL NOTES,

BY

JOHN B. SMITH, Sc. D.,
Professor of Entomology in Rutgers College.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

PREFACE.

The basis of good work in any science is a knowledge of what has been done in the past. This proposition does not need argument for its support, and it follows, logically, that any work which facilitates the acquirement of this basic knowledge and brings together systematically and critically the results theretofore obtained will also facilitate the advance of the science. The study of the North American Noctuidæ has been seriously embarrassed by the difficulty in acquiring this foundation; not always because books were lacking, but often because the knowledge was contained in so many without an index to guide the student. Since Mr. Grote's catalogue of 1874 no comprehensive bibliographical work on this family has been published, while the number of species has nearly doubled and the literature has increased enormously. This state of affairs results in the formation of card catalogues or indices made by each student to facilitate his own work, and gradually he becomes familiar with the knowledge published by his predecessors. But this does not help others, and the same work is done over and over again by those engaged in the same fields of study. It has also been extremely difficult, even after becoming familiar with the literature, to ascertain exactly what species were really before the older writers. Characters now regarded as essential were not even noted by them and descriptions which, with the few species at hand, were characteristic and pointed became vague and indefinite when larger material brought us many and closely allied species. The greatest bugbear to American Lepidopterists has been the work of Francis Walker in the catalogues of the British Museum. Mr. Grote after twenty years of study in the Noctuidæ had failed to identify a large percentage of the species, while even of the species described by Guenée forty years ago, a number are still unidentified in American collections. For ten years I have been accumulating material for a monograph of the North American Noctuidæ, and have examined about all the books obtainable in Philadelphia, New York, Washington, and elsewhere, and have purchased papers on the subject whenever opportunity offered. I have had, during that time, unusual opportunities for studying the material in the leading American collections, and some of the results obtained have been published in my various "Contributions toward a monograph of the Noctuidæ of Temperate North America."

Some years ago it was contemplated by Dr. C. V. Riley and myself to issue a complete monograph of this family, giving all that could be learned of the early stages as well as the more strictly systematic work, and for several years a great deal of material was gathered. It is to Dr. Riley that I owe a very large part of the facilities for study in the scattered collections, and my sincere gratitude is due to him for his many kindnesses of all descriptions. Pressure of more imperative duties compelled Dr. Riley to abandon his part of the work, and I have gradually published such portions as were completed.

With the knowledge to be obtained in American collections, the necessity for studying the material contained in those of Europe, and especially that in the British Museum, became constantly more obvious. In September, 1891, it became possible for me to get away for a few weeks, and in the interest of the United States National Museum under instructions from the assistant secretary of the Smithsonian Institute in charge of the Museum, I carefully studied parts of the collections contained in the museums at London, Paris, and Berlin, and visited also the Staudinger collection at Dresden.

The notes made by me during this trip are incorporated in the following pages; but a brief statement of the character and condition of the collections examined may not be amiss.

The British Museum contains of American Noctuidæ the material collected by Doubleday and worked over by Guenée in 1852, and by Walker between 1856 and 1858; the material from all other sources worked over by Walker during the same period; the Zeller collection and the Grote collection, besides the miscellaneous accumulations from all sources, including a very interesting lot collected by Lord Walsingham. The Doubleday material is in large part provided with locality labels, but it also contains specimens purchased by him, the fatherland of which is more than doubtful. Guenée has in some instances written "New Yorck," where nothing on the insect nor in the record will authorize it. It is in most cases easy to identify the specimens described by Guenée, though not all of them have labels in his handwriting. Walker had, in addition to the Doubleday material containing the Guenée types, a lot of material collected in Nova Scotia and in the British Possessions in North America. Some of the Abbot material is also in the collection. Mr. W. F. Kirby says (Can. Ent., xx, 231), "There are a number of specimens originally collected by Abbot in the British Museum and probably in other collections," and this is borne out by the fact that some of the specimens seen by me are evidently the originals of the figures contained in the magnificent collection of Abbot's drawings in the Museum. Among them are such rarities as *Cossus basalis* Wlk. (*Inguromorpha slossoni* Hy. Edw.), and *Acherdoa ferraria* Wlk. (*Varina ornata* Neum.), both of them only recently rediscovered and redescribed. The figures of these species are exact copies of the specimens furnishing Walker's types, though the Museum record gives no clue to the source of the specimens.

Much of the material described by Walker is in very poor condition, and it required a very thorough knowledge of the American fauna to identify the species in all cases. Walker's method, according to Butler (Journ. Linn. Soc., Zoöl., Vol. XII, pp. 402 and 432), and personal statements to me, was rather peculiar. His habit was to pin into a box, in series, as many specimens as it would conveniently hold, and then begin describing. At the end of the day's toil the box would be closed without indication of what had been accomplished, and next morning work would be recommenced from recollection of what had been previously done. None of the specimens were labeled until the descriptions were in type, and then, using a proof sheet, the printed names were cut out and pinned below the series of specimens, not on the insects themselves. Sometimes it happened that there were more names than insects; in such case the label was pinned into the box and, occasionally, the record "type lost," was made. Thus, sometimes two of Walker's names may refer to the same specimen as well as to the same species, and it is not always easy to ascertain when this is so. Judging from the fact that sometimes the descriptions do not in the least fit the specimens labeled, there is reason to believe that no great care in applying the names was exercised.

Messrs. Grote and Robinson, and afterward Mr. Grote alone, have examined the Walker material and have identified many of the species. In 1887 Dr. Riley looked over the material carefully and secured colored figures of many of the species theretofore unrecognized. These figures and the notes accompanying them, Dr. Riley has kindly loaned me and they have been of assistance to me in a number of instances. Mr. Butler has, recently, in rearranging the collection, published the synonymy of some others of the Walker species. Mr. Grote seems never to have spent sufficient time at the work to get more than a few scattering notes, and most of these seem to have been made without material for comparison and from recollection merely. Yet most of them are correct. Mr. Butler's knowledge of our fauna is altogether too slight to make his notes conclusive in the case of obscure species. Critical or synonymical notes should never be made except upon careful study and comparison by a specialist or one fully acquainted with the fauna concerned. Justice to an author requires that his writings be studied before relegating his species to the synonymy, and if neither time nor opportunity for such study exists, it is simply adding confusion to ignorance to make synonymical notes on superficial comparisons.

Mr. Henry Edwards has also on one or more occasions examined portions of the Museum collections, but seems never to have made any systematic study. He has informed me in conversation that he had notes on many of the Bombycids which he intended to put into shape for publication; but his untimely death prevented this.

The new arrangement of the noctuids in the British Museum is utterly at variance with accepted standards. Mr. Butler's generic associations embrace species of *Hadena*, *Mamestra*, *Tæniocampa* and others under one term, while closely allied species may be widely separated under different generic names. Mr. Butler has not, to my knowledge, given any key to his classification, and criticism is therefore impossible. I wish simply to call attention to the fact that in this collection the arrangement of the species is on a unique basis, and that few of the generic associations are pure, according to German, French, and American definitions. Judged by these standards the arrangement is an utterly unscientific hotchpotch. In the course of this rearrangement, Mr. Butler has united the Grote and Zeller material with the old collection, forming one series. The Walker types are ascertained and the printed label associated with the specimen is placed on the pin. If the Walker name has priority, a "type" disk is pinned next to it. If the name is a synonym, the "type" disk is put on the pin with the insect and with the printed label. In all cases where the type of a species is in the series a "type" disk next the specimen calls attention to it. This greatly facilitates the search for species, and my task was considerably lightened by my ability to compare the Guenée, Walker, and Grote types side by side. Mr. Butler has published critical and synonymical notes on the species so far as arranged, much the greater part of them in the "Entomologist," since my visit to the Museum. In the majority of instances the associations are correct; but much of the synonymy given was already known, and in that which is new there are some bad errors, caused by the failure to compare structural characters and relying only on an apparent, superficial resemblance. But many species were yet left unidentified with the other American material. In those parts of the collection not yet arranged, the work was more tedious and involved more labor. There was an advantage, however, in the fact that the arrangement was according to Walker's catalogues and it was thus easy to find the specimens, little as the association might be warranted. Mr. Butler in his rearrangement seems to have preserved, as far as possible, every original label that would indicate or aid in identifying a type and has additionally marked those specimens that he considers as such.

I thus made my studies under exceptionally favorable circumstances. The Grote collection is really the basis of the nomenclature in American collections generally, and a very great point was gained when I could identify the Guenée and Walker names with the Grote names for the same species. In addition, I had with me a small series of specimens generally unnamed in collections, or of which I was doubtful, and these were carefully compared. A full set of my own monographic papers enabled me to verify the correctness of the identifications there made, and a series of notes and drawings aided me in other groups. In the Deltoids I had drawings of nearly all the species as they are named in the National Museum, and these were carefully compared and the synonymy noted. I think I can claim a familiarity with a very large percentage of the American species, and I could thus readily determine in most instances whether or not I correctly knew the insects. As my time was limited, I did not study *Acronycta*, which Dr. Riley had already studied on a prior occasion, nor *Catocala*, which Messrs. Grote and Henry Edwards had compared. Outside of these genera I found all save four or five of the Walker species, and was able to recognize nearly all of them. Of those not found; Mr. Butler has seen no trace as yet, and they may be "lost." Some few, I believe five species, described by Mr. Walker, from the Saunders collection, now at Oxford, are yet unknown to me, as I could not get to that city.* The species described from Dr. Bethune's collection I have previously identified, and the types are now in the National Museum. In Vols. V and VI of the Canadian Naturalist and Geologist, Mr. Walker described a few species collected by Mr. D'Urban, and afterward donated to the Entomological Society of Ontario. These Mr. Grote has examined, and most of them were identified with other described species; the others were omitted from all of Mr. Grote's lists, and were forgotten. To the kindness of Mr. J. Alston Moffat, curator of the Society, I owe an opportunity of examining these species, and have identified them in the following pages.

I desire at this point to express my sincere thanks to Mr. Butler and to the entire Entomological Staff of the British Museum, for the ready courtesy and great kindness with which they gave all aid in their power to facilitate my work. A regretable attack of illness confined Mr. Butler to his home during most of my stay, else I might perhaps have succeeded in finding a trace of the few yet unidentified species. I do not at all agree with Mr. Butler's ideas on Noctuid genera, yet this does not prevent a high appreciation of the work he has done, nor a feeling of sincere gratitude for the good-natured readiness with which he gave me all the assistance in his power.

A knowledge of the collections now in the British Museum is the basis of our knowledge of the North American Noctuidæ to-day.

Some of the species described by Guenée are in the Jardin des Plantes in Paris, and this I also visited. The museum and the collections there were a distinct disappointment. Not only is it cooped up in numerous small rooms, packed in inconvenient places, but for years past it seems to have had little or no attention, and there is apparently no pretence of arrangement. Yet with the kind assistance of M. Aug. Sallé, I did succeed in getting at most of the species marked "M. N.," in the species Général. I was in hopes of being able to get track of the Abbot drawings, from which Guenée described a number of species; but I did not succeed in this. It was a matter of great regret to me that I did not spend the time devoted to Paris, in visiting M. Oberthür at Rennes; but I did not realize how little there was of importance, at Paris, and how much there was at Rennes. The brief time at my disposal made it impossible to repair the error and I went on to Berlin.

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* I have since, by the kind assistance of Mr. Wm. Schaus, identified three of them.

Here again I found a well-preserved and well-arranged collection, not particularly rich in North American species, but with many South American forms valuable for comparisons, generic and otherwise, and with a considerable number of arctic forms, including some of Dr. Staudinger's types.

I owe thanks here to Dr. Karsch for his obliging courtesy in giving such assistance as I asked. In fact, the most pleasant and agreeable features of my trip were the hearty coöperation I met with everywhere and the ready willingness to aid, by any means in their power, that distinguished all those having charge of the collections I desired to see.

The trip to Dresden was a distinct disappointment. Dr. Staudinger was not in town, and the Moeschler collection had not been acquired by him as I had been informed it had. Mr. E. Bang-Haas did all in his power by showing me such northern material as had been studied by Dr. Staudinger; but this was a poor substitute for what I had expected or had been led to expect. My leave of absence was then about exhausted and I returned to America via Bremen.

In preparing the notes made in the European collections I found that it would be necessary to refer to the greater part of the described species, and after consulting with Dr. Riley, I concluded to prepare a catalogue embodying not only my notes on the types in foreign collections, but also on those in American collections. My aim is to give, as nearly as may be, the present location of the type specimen of every noctuid species described from America since Guenée wrote.

This necessitates a reference to some of the American collections containing types. Of the individual collections, by far the most important is that of Mr. B. Neumoegen, of New York city. Mr. Neumoegen has succeeded in accumulating a very large amount of valuable material, mainly from the Western States, and this has been in large part named by Mr. Grote, Mr. Henry Edwards, and more recently by myself. He has the types of 233 or about 13 per cent of our species; not always unique types, but specimens so marked.

Next in importance is the collection of the late Henry Edwards, also of New York city. Mr. Edwards described many species from his own collection and furnished specimens for a considerable number of the species described by Messrs. Grote and Harvey. A large part of the value of Mr. Edwards' collection is derived from the fact that he personally collected a very great portion of it, and that it is labeled with the exact locality of capture and not merely with a State label. This collection has been acquired for the American Museum of Natural History in New York city, and will be, when in place there, a most valuable one for the student.

The collection of Mr. Fred Tepper, of Brooklyn, now the property of the Agricultural College of Michigan is next in rank, containing 114 types, many of them described by Mr. Morrison, and some of them duplicating the "types" in other collections.

The Strecker collection at Reading, Pa., contains a considerable number of types; not only all that were described by Dr. Strecker himself but also some of those described by Mr. Morrison and Dr. Behr.

At some distance behind are the collections of Mr. E. L. Graef, of Brooklyn, N. Y; Dr. Roland Thaxter, of Cambridge, Mass.; Dr. J. A. Lintner, of Albany, N. Y.; Dr. George D. Hulst, of Brooklyn, N. Y.; Mrs. C. H. Fernald, Amherst, Mass., and the collections of Dr. James Bailey and Mr. W. W. Hill, both of Albany, N. Y., deceased.

I owe thanks in each case to the owners of the collections above named for courtesies extended to me and in some cases for lists of the types contained in the collections; all of which are incorporated in the following pages.

Perhaps a few words concerning "types" may not be entirely out of place right here. Dr. Hagen holds that every specimen named by an author of a species described by himself, is a type. Mr. Morrison was yet more liberal and marked as "type" a number of specimens of species described by Mr. Grote, having presumably compared them with the actual type. Mr. Grote's practice seems to have been to mark all specimens before him when writing his original description, as "type," and I think Mr. Grote is right. It is the sum of the characters of the specimens before the describer that makes the species, and though neither may be the type of *all* the characters, yet all are types of the species. There are thus instances where types of Mr. Grote's species are in two or more collections. This is more especially true of the species described in his earlier and most recent writings; the first, presumably, because of the greater dependence for material upon individual collections; the second after the sale of his collection, when he gave away most, if not all, the material received. In the case of my own species "types" are often even more widely distributed. I deem it a positive advantage to have types in several collections, but I would name nothing a type which came to hand after the original description was written.

The Bailey collection is now in the hands of Dr. T. P. Bailey, son of Dr. James Bailey, by whom the collection was made. It has more types than I have noted; but my notes on the collection are scant and were made several years ago. The W. W. Hill collection is in the care of his family, and is for sale. It contains comparatively few unique types, but is valuable from the long series of specimens accurately labeled with the exact locality and usually also with the date of capture—a very treasure to the student. Dr. Lintner's collection is valuable for much the same reason. From these collections Mr. Grote obtained much of the material from which he described, and the returned specimens while not often marked "type" except in the early days, are yet typical in that they formed part of the material on which the species was based.

Dr. Thaxter has collected extensively in Massachusetts and Maine and to a less extent in Florida. These collections furnished types for many species described by Mr. Grote, and of which Dr. Thaxter has duplicates. His material is thus largely typical while not often marked "type." The collections made by Mrs. Fernald at Orono, Me., are in much the same case. She furnished the material for a number of new species to Messrs. Grote and Morrison, but has few "types."

The Graef collection contains many rarities collected years ago, when Mr. Grote first began his studies, and contains also a share of the material collected by Morrison. A very great proportion of the species were determined by Mr. Grote, and the specimens often form part of the material from which the descriptions were made.

The Hulst collection, now in my charge at Rutgers College, is especially rich in Catocalæ, typifying Dr. Hulst's work in that genus, and it contains types also in several other genera.

Prof. F. H. Snow, of Lawrence, Kans., has types of a few species, but furnished the material for a considerable number of descriptions. His New Mexican material was all named by Mr. Grote and is typical of three papers on New Mexican moths.

Prof. George H. French, of Carbondale, Ills., has types of a few species described by himself and there are a few other types scattered in various collections.

Mr. David Bruce has collected extensively in Colorado and his collections have furnished types of a considerable number of species, most of them described by myself. Most of these types are not in Mr. Bruce's collection; but I have so labeled some of the material returned to him, where it formed part of the original lot from which the descriptions were made. The determinations of my own species in that collection are nearly all made by comparison with the original types.

Of Institutions containing noctuid types, the Agricultural College of Michigan contains the Tepper collection already mentioned. A few type specimens are in the Cornell collection at Ithaca, N. Y. Rutgers College has the Hulst collection and types of some of my species. The Hy. Edwards collection is in the American Museum of Natural History.

In the collection of the American Entomological Society of Philadelphia are a number of types of the species described by Messrs. Grote and Robinson, and also of some described by Mr. Grote alone. In the Canadian Entomologist, IV, 109, Mr. Grote writes concerning the work by Mr. Robinson and himself: "The collection on which these and all our other joint entomological writings were based, is now in the possession of the American Entomological Society." If that was true in 1872, it certainly is not so now, because but a very few of the species are at present in that collection. Of these, a very small proportion only have a written label. Some have a little printed "type" label; but nothing to indicate of what it is the type. In at least two cases I found these "type" specimens under names with which they had no possible relationship. Fortunately the excellent figures given in illustration of the papers referred to, make it possible to ascertain the names of which the specimens are typical. But many species have disappeared, leaving no trace; in whose hands they are at present I have been unable to ascertain. Mr. Grote, in the third and fourth volumes of the Transactions of the American Entomological Society, published a number of descriptions referring to the types as in this same collection. Most of these also have disappeared except in the Deltoids where nearly all are present, properly labeled. Here, however, museum pests have been at work and some of the specimens are in a very precarious condition. I have compared many specimens to get a duplicate series as nearly as possible resembling the originals. This series will be deposited in the United States National Museum, when completed. But Mr. Grote's statement, above cited, was too broad. I think he must have intended to refer to the Noctuids only, for, certainly, many of the types in other families are in the American Museum of Natural History, New York city.

In the museum of the Boston Society of Natural History is the Harris collection, containing a considerable number of specimens labeled by Harris himself. There are also a few of Mr. Morrison's types in the collection.

At Cambridge, in the Museum of Comparative Zoölogy, are most of the types of Dr. Packard's species described from Labrador. These were originally in the Museum of the Peabody Academy, at Salem, where I first saw them, and they were then in a sadly fragmentary condition, and on the high road to complete destruction. Their transfer to Cambridge was a decidedly wise move, and when I last saw them there they looked much better and bid fair to last for some time to come. A carefully compared set of specimens is a desideratum. For his work on the North American Lepidoptera, Zeller derived a considerable portion of his material from this collection, and most of his noctuid types are here. A few Grote and Morrison types are also deposited here.

The collections in the U. S. National Museum are very rich in noctuidæ, but have comparatively few types of the older authors. A small number of the Walker types were donated to the museum by Dr. C. J. S. Bethune, at my request, in 1891. All of Dr. Riley's species are represented in the collection, forming part of his gift to the museum, and in that collection were also a few Morrison types. Morrison's types, it will be noted, are everywhere. The collection originally formed by myself was purchased by the museum, and contained types of a few species described by myself, and of a number of species described and given me by Mr. Grote after the sale of his collection to the British Museum. In the Meske collection, now also in the museum, there are a few types by Grote, Harvey and Lintner, while it also contains nearly the same series of species to be found in the other Albany collections previously mentioned. The Belfrage material purchased for the museum contains no types, but it contains a duplicate series of many of the Texan species described by Messrs. Grote and Harvey, often under the exact label in number and color mentioned in the characterization of the type.

Of the species more recently described by myself, the museum contains a large proportion of the types. It has been my effort to place, so far as I could do so, the types of all my species in this museum, and to make it, for the future American students, as nearly typical and complete as possible. My various contributions toward a monograph of the noctuidæ are based on this collection, and the collection is arranged and named in accord with my published work, which it thus typifies. In the American noctuidæ this collection is, in the quality of material, the length of series, the localities represented, and range of variation shown, by far the best in the country or even in the world, for the British Museum series is very much poorer in specimens, though incomparably richer in types.

With the above explanation, the references to the location of types made in the following pages will be easily understood.

As already indicated, my systematic work necessitated the formation of a card catalogue. As a starting point I adopted Mr. Grote's bibliographical list of 1874, and transferred it to cards, adding subsequent references from time to time so as to keep it up to date. Naturally enough I followed Mr. Grote's plan at first and noted neither the date of the publication nor the dates of flight, even when given. Localities were indicated only in the most general terms. I soon found that I could not rely on the accuracy of Mr. Grote's references in all cases, and that there was no pretence of completeness in the bibliography. Occasionally only the name of the publication and page were given and neither volume nor year. I have therefore, in almost every case verified the references given, and where I have copied bibliography and synonymy without verification I have generally stated that fact. In spite of all care I can not hope to have escaped errors. Every reference has been transcribed from original note to card and from card to manuscript, and finally transferred to type. This leaves a margin for error, and although I have in the great majority of cases verified the reference to original description from the manuscript, errors may have crept in and may have been overlooked.

The omission of dates of publication in my original cards made it necessary to go over every reference to make the addititition and here I found Dr. Hagen's "Bibliotheca" invaluable. Yet the dates given of some of the older works issued in parts can be considered as approximate merely. In most cases this is of little practical importance, and where it is, I have gotten as close to the truth as I could. Some of these works bear the date of the preface or title page while the body of the work may not have appeared for some years afterward. Hübner's Verzeichniss is dated 1816 and contains references to the noctuidæ in the second hundred of the Zutræge which, according to Mr. Grote in Can. Ent., XIII, 92, was published in 1823. Now, either the references were published from five to seven years before the descriptions and plates appeared or the Verzeichniss was not published until long after its date. In view of this fact and the fact that the entire first hundred of the Zutræge is referred to, no earlier date than 1820 can be reasonably assumed for Hübner's list. This makes it long subsequent to Ochsenheimer's Systema Glossatorum, also dated in 1816 and, I believe, actually published about that time. Yet I have cited 1816 as the date of the Verzeichniss in most cases where it conflicts with no other reference. Usually the dates given by Dr. Hagen have been accepted as controlling.

In citing references from society publications I have used the date given on the printed forms, even where I was well assured that the date was later, wherever this method would not involve the question of priority. The noctuidæ have been singularly fortunate in offering a very few cases only in which there could be any serious doubt as to which name had priority. In 1874 and 1875, when Messrs. Grote, Morrison, Harvey, and Strecker were publishing at about the same time, several species were twice described, with narrow margins between the dates of publication; but these margins were at once fixed and no confusion resulted. In a number of cases Mr. Grote has duplicated descriptions in separate journals, each description purporting to be that of a "n. sp." Thus, descriptions in the Bull. Bkln. Ent. Soc. are duplicated in the Canadian Entomologist, while descriptions in that journal are duplicated in the Bull. Buff. Soc. Nat. Sci. As this duplication occurred mainly at about the date Mr. Morrison was describing, I assume that it was intended to secure two chances of priority.

In citing localities to show geographical distribution, a variety of difficulties arise. Few species are so evenly distributed as to occur in all parts of any large region, and yet, in giving the geographical range in a work of this character it is practically impossible to give details even when ascertainable. Many of our States afford varieties of surface, of climate and of geological formation that support quite different sets of moths. To cite "New York," for instance, does not indicate that the species occurs all over that State. Many species are found on Long Island that are not found at Albany, while the Albany region affords many peculiar forms not thus far duplicated elsewhere in the State. The Catskill and Adirondack regions each have forms peculiar to themselves, while along the northern and western boundaries of the State still other forms occur. Most of the other States are in much the same case, and in some the matter is more serious. Texas has two quite distinct faunal regions, one of them giving the normal Atlantic forms, the other extending into New Mexico and Arizona, and giving quite a distinctive set of species. Colorado has a surprisingly varied fauna, as will appear in the following pages. Yet a citation by

States or by groups of States has been the only one feasible. A species may occur in New York, Pennsylvania, Massachusetts, Vermont and Maine, and only in one or two localities in each; yet the entire geographical group will be cited. I have endeavored, however, to specify as much as possible in a work of this kind. By such expressions as "Canada to Texas to Colorado," it is intended to indicate that between these extremes the species has been recorded from most of the States. The term "Canada," as here used, includes the Provinces of Ontario and Quebec, other British possessions being cited as published or labeled. Finally, I have reason to believe that the "East Florida" of the British Museum list may mean Texas or Georgia as often as what is now known as Florida.

The sources for the localities given are the original descriptions, lists published by Lintner, Thaxter, Snow, Van Duzee, Hill, Mrs. Fernald, and others, in the entomological journals and elsewhere, a very complete list of species taken in Colorado by Mr. Bruce, the collections at Rutgers College, and in the National Museum, and the duplicate lists of species named by me for correspondents for several years past. The dates given are from the same sources, the National Museum collection being especially well labeled in the Californian and Texan series.

My studies in the noctuids have been almost exclusively systematic, and the references made by me on the cards were such as would facilitate my work in that direction. I have included all references to descriptions of early stages, habits, etc., found in the entomological and scientific journals or publications, but have not searched economic literature. This latter has grown to such enormous proportions in recent years that it merits a separate index, and there is so much repetition, so much compilation, and so much duplication that to include the matter here would have extended the work unnecessarily. Mr. Henry Edwards in his catalogue of the described early stages of Lepidoptera, Bulletin No. 35 of the National Museum, has covered this ground fairly well, and I have not recognized the necessity of duplicating all his references.

The only exceptions made are that I have cited Dr. Riley's Missouri reports, some of Dr. Lintner's reports, and the volumes of the Entomological Commission; the first and second of these because they contain descriptions of new species, and in the case of Dr. Riley's reports, excellent and characteristic figures: the latter because the treatment is scientific and monographic, containing exhaustive treatises on all phases of structure, habit, and development.

Bulletin 35 of the U. S. National Museum should be, therefore, bound with the present work to complement and complete it.

Our literature contains a large number of notes on species, giving no new or useful information and of merely local interest. References to these have been omitted. The object has been to give: (1) The place of original description; (2) complete redescriptions; (3) additions to the knowledge concerning the species; (4) the changes made in generic location. Under this latter head I have not included references to such lists as adopt a different generic term for an entire genus, *e. g.*, Mr. Grote uses *Apatela* and *Heliophila* for *Acronycta* and *Leucania*; but I have not cited his lists for this change in term since it does not carry with it any suggestion of difference in structure. Where a species appears in the catalogue in a genus different from the one last cited, the reference is usually to be credited as original here or in my list of the Lepidoptera of boreal America, published in 1891.

In synonyms the same rules are observed, because the literature of the synonym is often better or more accessible than that of the original species, and the final reference given is that which places the name as a synonym. Usually I have given a reference only to the first positive statement of the synonymy; but where more than one observer have independently so referred a name, I have as a rule cited them all. Where no reference to the synonymy appears in the bibliography it is original here.

Finally, while I have given the reference to the original descriptions of the genera, I have not given generic synonyms nor references to redescriptions of a genus. The generic synonymy appears sufficiently in the bibliography of the species, while redescriptions will be readily found under the same references. I have made no attempt to specify the "types" of genera, for opinion differs in many cases in which I have made no original study of the matter, and I do not care to adopt or reject conclusions without some verification. Usually Mr. Grote has been followed except in his use of certain Hübnerian genera. I do not think that under the utmost latitude the Tentamen should be considered authority for a generic term, while the Verzeichniss names so far as applicable must be used eventually. It follows from this that in some cases older generic terms may have to be substituted for those now in use; but I think such cases will not be great in number.

With this somewhat lengthy explanation of the origin and purpose of the catalogue I submit it to the consideration of lepidopterists generally.

All the species contained in the National Museum collection are marked with an asterisk (*). I hope that those who have species not so marked, in duplicate, will send specimens to complete the collection for the benefit of students generally. The advantage of a central, complete collection accessible at all times, constantly cared for, the property for all scientific ends of students generally, can not be overestimated.

JOHN B. SMITH.

RUTGERS COLLEGE, *April 5, 1892.*

INDEX TO AUTHORS AND WORKS CITED.

Only those works of an author cited in the catalogue are here noted. Works published in the Proceedings or Transactions of an Institute or Society are cited from the society's publication in most instances, and only rarely by the title of the memoir. Under the name of each author is given a list of his books here cited. Names which have no such lists appended, represent authors that have published on American Noctuidæ in periodical, society, or institute literature only. Periodical, society, and institute literature is indexed by the first word of the usual abbreviation. Separate works are found only under the name of the author and are not independently indexed by their usual abbreviation.

So far as it goes, Hagen's *Bibliotheca Entomologica* has furnished dates and titles; more recent works are in most cases given from my own notes. The dates given are of the beginning and end of works issued in parts, or those given on the title page of others. Periodical literature is not dated here, the date of the volume or part cited being always given in the catalogue.

SIGNS USED.

*Specimens are in the National Museum collection.
‡Name cited in error.
‖Name preoccupied.

Amer. Ent. The American Entomologist: An illustrated magazine of popular and practical entomology. New York.

Am. Journ. Sci. Silliman's American Journal of Arts and Sciences.

Amer. Nat. The American Naturalist: An illustrated magazine of natural history. Philadelphia.

Andr. Andrews, W. V.

Angus, James.

Ann. Lyc. Nat. Hist. N. Y. Annals of the Lyceum of Natural History in New York. Published by the society.

Ann. and Mag. Nat. Hist. Annals and Magazine of Natural History. London.

Ann. Soc. Ent. Belg. Annales de la Société Entomologique de Belgique. Bruxelles. Published by the society.

Ann. Soc. Ent. Fr. Annales de la Société Entomologique de France. Paris. Published by the society.

An sp. dist. A distinct or good species: not a synonym.

Bailey, Dr. James.

Bates, J. Elwyn.

BDV. or BOISD. Boisduval, Jean Alphonse.

IC. HIST. DES LEP. Icones historiques des Lèpidoptères d'Europe, nouveaux ou peu connus. Paris, 1832–1843.

FN. ENT. MADAG., LEP. Faune entomologique de Madagascar, Bourbon et Maurice, partie des Lépidoptères. Paris, 1834.

GEN. ET. IND. METH. Genera et Index methodicus europæorum Lepidopterorum, Paris, 1840.

IND. METH. Europæorum Lepidopterorum index methodicus. Paris, 1829.

BEAN, Thomas E.

BEAUV. Palisot de Beauvois, A. M. F. J.

INS. AFR. ET AM. Insectes recueillis en Afrique et en Amérique dans les royaumes d'Oware, Saint-Domingue et dans les États Unis pendant les années 1781–1797. Paris, 1805–1821.

BEHR, Dr. Hermann.

BEHRENS, James.

BERLIN. MAG. Berliner Magazin.

BETH. Bethune, Rev. C. J. S.

BEUT. Beutenmüller, William.

BKH. *See* BORKH.

BORKH. Borkhausen, Moriz Balthasar.

NATURG. EUR. SCHMETT. Naturgeschichte der europaeischen Schmetterlinge nach systematischer Ordnung. Frankfurt, 1788–1794. Noctuæ in Vol. IV, 1792.

BRACH, John P.

BREHME, H. H.

BULL. BKLN. ENT. SOC. Bulletin of the Brooklyn Entomological Society. Published by the society, 1877–1884.

BULL. BUFF. SOC. NAT. SCI. Bulletin of the Buffalo Society of Natural Science. Published by the society, Buffalo, N. Y.

BULL. CAL. AC. SCI. Bulletin of the California Academy of Sciences. Published by the academy, San Francisco.

BULL. GEOL. SURV. Bulletin of the United States Geological and Geographical Survey of the Territories, Washington, D. C.

BULL. U. S. NAT. MUS. No. 38. Bulletin of the United States National Museum, No. 38. Washington, 1890. Revision of Agrotis.

BUNKER, Robert.

BUTLER, Arthur G.

CANADIAN JOURNAL, The. Published in Toronto. New series, Vol. XI, 1865 is the only volume cited.

CAN. ENT. The Canadian Entomologist. Published by the Entomological Society of Ontario at London, Ontario.

CAN. NAT. AND GEOL. The Canadian Naturalist and Geologist, Montreal.

CAULFIELD, F. B.

C. B. MUS., HET. Catalogue of the Lepidoptera Heterocera in the British Museum. 1856–1868. Forming Vols. IX to XXXVI of the Lepidoptera.

CLEM. Clemens, Brackenridge.

CLERCK, Carl Alexander.

ICONES. Icones insectorum variorum cum nominibus eorum trivialibus locisque e C. Linnæi syst. nat. allegatis. Holmiæ, 1759–1764.

COMSTOCK, John Henry.

COTTON INSECTS. Report upon Cotton Insects prepared under the direction of the Commissioner of Agriculture in pursuance of an act of Congress approved June 19, 1878. Washington, D. C., 1879.

COQUILLETT, D. W.

CORR.-BLATT. Correspondenzblatt, für Sammler von Insecten, insbesondere von Schmetterlingen. Regensburg, Manz.

CRAM. Cramer, Pieter.

PAP. EX. Papillons exotiques des trois parties du monde, l'Asie, l'Afrique et l'Amérique, rassemblés et décrits par Pierre Cramer. Dessinés sur les originaux, gravés et enluminés sous sa direction. Amsteldam, Balde. 1775–1782, Vols. I–IV.

CROFT, Henry H.

CURT. Curtis John.

APP. TO ROSS. NARR. 2ND VOY. Description of the insects brought home by Commander James Clark Ross; second voyage. Appendix Nat. Hist., 1831.

DALM. Dalman, Johann Wilhelm.

DIMMOCK, A. K., ANNA KATHERINE.

DODGE, G. M.

DRU. Drury, Drew.

ILLUSTR. Illustrations of natural history, wherein are exhibited upwards of two hundred and forty figures of exotic insects according to their different genera, etc. London, 1770–1782.

DUNCAN, James.

DUP. Duponchel, Philogène Auguste Joseph.

CAT. MÉTH. Catalogue Méthodique des Lépidoptères d'Europe distribués en familles, tribus et genres, avec l'exposé des caractères, etc. Paris, 1844–1846.

DYAR, Harrison G.

EDW. Edwards, William H.

ENT. AMER. Entomologica Americana; organ of and published by the Brooklyn Entomological Society, 1885–1890, at Brooklyn, N. Y.

ENT. MO. MAG. The Entomologists' Monthly Magazine, London: Van Voorst.

ENT. NEWS. Entomological News and Proceedings of the Entomological Section of the Academy of Natural Sciences. Published by the Amer. Ent. Soc., Philadelphia.

ENTOMOLOGIST. The Entomologist; an illustrated journal of general entomology, London.

ESP. Esper, Eugen Johann Christoph.

SCHMETT. Die (Europæischen) Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen. Erlangen, 1771–1794. Noctuids in Pt. IV, 1786. Suppl., 1805–1807.

FABR. Fabricius, Johann Christian.

SYST. ENT. Systema Entomologiæ sistens Insectorum classes, ordines, genera, species, adjectis synonymis, locis, descriptionibus, observationibus. Flensburgi et Lipsiæ, Korte, 1775.

GEN. INS. Genera eorumque characteres naturales secundum, numerum, figuram, situm et proportionem omnium partium oris adjecta mantissa specierum nuper detectarum. Chilonii, Bartsch, 1777.

SPEC. INS. Species Insectorum exhibentes eorum differentias specificas, synonyma auctorum, loca natalia, metamorphosin, adjectis observationibus, descriptionibus. Hamburgii et Kilonii, Bohn, 1781.

MANT. INS. Mantissa Insectorum sistens eorum species nuper detectas adjectis characteribus genericis, differentiis specificis, emendationibus, observationibus. Hafniæ, Proft, 1787.

ENT. SYST. Entomologia systematica emendata et aucta, secundum classes, ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus. Hafniæ, Proft. 8, T. III, pars 1 et 2, 1793 and 1794.

FAGER, D. B.

FELD. Felder, Cajetan.

REISE DER NOV., ZOOL. Reise der Oesterreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Zoologischer Theil, zweiter Band, 1864–1875.

FISCHER, Philip.

FITCH, Dr. Asa.

REPT. INS. N. Y. Reports on the noxious, beneficial, and other insects of the State of New York. 13 reports, beginning 1855.

FOURTH REPT. ENT. COMM. Fourth Report of the United States Entomological Commission. U. S. Department of Agriculture, Washington, 1885.

FRENCH, George H.

CAT. ILLS. Synopsis of the Catocalæ of Illinois. From the curator's report in the 7th Ann. Rept. of the Principal to the Board of Trustees of the So. Ills. Normal Univ., Carbondale, Ill., 1882

G. AND R., or GRT. AND ROB. Grote (A. R.) and Robinson (C. T.)

GENTRY, Thomas A.

GERM. Germar, Ernst Friedrich.

GEYER CARL. *See* Hübner for Zuträge.

GMEL. Gmelin, Johann, Friedrich.
  ED. LINN. SYST. NAT. Systema Naturæ, &c., ed xiii, aucta, reformata cura Joa. Frid. Gmelin, Lipsiæ, 1788-1793. Insects in Vol. I, pts. 4 and 5, 1789.

GN. Gúenée, Achille.
  ESSAI, sur la classification de noctuélides. In Ann. Soc. Ent. Fr. 1837-1839.
  NOCT. IND. METH. Noctuarum Europæarum index methodicus, etc. Ann. Soc. Ent. Fr. 1841, 235-250.
  SP. GEN. LEP., NOCT. Species Géneral des Lépidoptéres. Noctuelites, Vols. I-III. Paris, 1852, in the suites à Buffon forming Vols. V-VII of the Lepidoptera.
  SP. GEN. LEP., DELT. As before. Deltoides and Pyralites. Paris, 1854. Forms Vol. VIII, of the Lepidoptera.
  SP. GEN. LEP., PHAL. As before. Uranides, Phalénites T. i. and ii, Paris, 1857. Forms Vols. IX and X of the series.

GOEZE, Johann August Ephraim.
  BEITR. Entomologische Beiträge zu des Ritter Linné zwölften Ausgabe des Natursystems. Leipzig, 1777-1781.

GOODELL, L. W.

GOODHUE, Charles H.

GOSSE, Philip Henry.
  CAN. NAT. The Canadian Naturalist, a series of observations on the Natural History of Lower Canada. London. 1840.

GRT. Grote, Augustus Radcliffe.
  CHECK LIST NOCT. or LIST NOCT. Check List of the Noctuidæ of America north of Mexico. Buffalo, Reinecke & Zesch. Pt. I, 1875, pt. II, 1876.
  NEW LIST. New Check List of North American Moths, 1882.
  ILL. ESSAY. An Illustrated Essay on the Noctuidæ of North America, with "A Colony of Butterflies." London, 1882.
  REVISED LIST, 1892.

GUÉR. Guérin-Meneville, Fèlix Édouard.
  ICON. RÈGNE ANIM. Iconographie du règne animal de G. Cuvier, etc. Paris, 1829-1838.

GUNDLACH, Dr. Juan.
  CONT. ENT. CUB. Contribucion Entomologia Cubana. Havannah, 1886.

HARR. Harris, Thaddeus William.
  REPT. INS MASS. A report on the insects of Massachusetts injurious to vegetation. Cambridge, 1841-1842.
  ENT. CORR. Entomological correspondence of Thaddeus William Harris, M. D. Edited by Samuel H. Scudder. Boston Soc. Nat. Hist. Occasional papers, 1869.

HARR. INJ. INS., FLINT ED. A treatise on some of the insects injurious to vegetation. Edited by Charles L. Flint. New York, 1862.

HARV. Harvey, Dr. Leon F.

HAW. Haworth, Adrian Hardy.
  LEP. BRITT. Lepidoptera Brittannica, sistens digestionem novam Insectorum Lepidopterorum quæ in Magna Britannia reperiuntur, etc. London, 1803-1812.

HBN. Hübner, Jacob.
  SAMML. EX. SCHMETT., Sammlung exotischer Schmetterlinge. Augsburg, 1806-1824.
  SAMML. EUR. SCHMETT. Sammlung europäischer Schmetterlinge. Augsburg, 1806-1824.
  VERZEICHNISS. Verzeichniss bekannter Schmetterlinge. Augsburg, 1816. The noctuidæ in the volume were not issued until after 1818.
  ZUTRAEGE. Zutraege zur Sammlung exotischer Schmetterlinge, bestehend in Bekundigung einzelner Fliegmuster neuer oder rarer nicht europäischer Gattungen. Augsburg, 1818-1823, 1825-1832 (von Carl Geyer) 1837 (von Carl Geyer).

HFN. Hufnagel.
  BERLIN. MAG. Berliner Magazin.

HOCH. von Hochenwarth, Sigmund.

H. SCH. Herrich-Schaeffer, Gottlieb August William.
  EUR. SCHMETT, or SCHMETT EUR. Systematische Bearbeitung der Schmetterlinge von Europa, als Text, Revision und Supplement zu J. Hübners Sammlung europäischer Schmetterlinge. Regensburg, Manz., 1843-1856. Noctuida, Vol. II, 1845.

H. Sch. Herrich-Schaeffer, Gottlieb August William—Continued.

Exot. Schmet, or Lepid. Exot. Lepidopterorum exoticorum species novæ aut minus cognitæ. Collection de nouvelles espèces de Papillons exotiques. Ratisbonæ, 1850–1858.

Neue Schmett. Eur. Neue Schmetterlinge aus Europa und den angrenzenden Ländern. Regensburg, 1856.

Hulst, George D.

Humph. Brit. Moths. British moths and their transformations. Arranged and illustrated in a series of plates by Henry W. Noel Humphreys. London, 1857.

Hy. Edw. Edwards, Henry.

Insect Life. Devoted to the economy and life habits of insects, especially in their relations to agriculture. Periodical bulletin of the Division of Entomology, United States Department of Agriculture. Washington, D. C.

Jardine Nat. Libr. The Naturalist's Library, by Sir William Jardine. Edinburgh. Lepidoptera, 1835–1841.

Johnston, James.

Kellicott, David.

Kirby, William.

Fn. Bor. Amer. Fauna boreali-Americana, or the zoölogy of the northern parts of British America, containing descriptions of the objects of natural history collected on the late northern land expeditions under command of Sir John Franklin. Part IV, The Insects, 1837.

Koebele, Albert.

Latr. Latreille, Pierre André.

Gen. Crust. et Ins. Genera crustaceorum et insectorum secundem ordinem disposita, iconibus exemplisque plurimus explicata. Paris, 1806–1809.

Consid. Gén. des Crust. et Ins. Considérations générales sur l'ordre natural des animaux composant les classes des Crustacés, des Arachnides et des Insectes, avec un tableau méthodique de leurs genres disposés en famillies. Paris, 1810.

Led. Lederer, Julius.

Noct. Eur. Die Noctuinen Europas, mit Zuziehung einiger bisher meist dazu gezählten Arten des asiatischen Russlands, Kleinasiens, Syriens u. Labradors. Wien, 1857.

Lefb. Lefebure, Alexandre.

Linn. or Linné. Linné, Carl von.

Fn. Suec. Fauna Suecica sistens animalia Suecicæ regni. Quadrupedia, Aves, etc. Editio altera auctior. Stockholmiæ, 1761.

Syst. Nat., Ed. X. Systema Naturae per regna tria naturae secundum classes, ordines genera, species, cum characteribus, differentiis, synonymus, locis, ed. decima reformata, Holmiae I, 1758; II, 1759.

Syst. Nat., ed. XII. Systema naturae per regna tria naturae secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis, ed. duodecima reformata. Holmiae, I, 1766, II, 1767, III, 1768.

Mus. L. U. Museum S. R. M. Ludovicae Ubricae Reginae, etc., in quo animalia rariora, exotica, inprimis insecta et conchilia describuntur et determinantur, prodromi instar editum. Holmiae, 1764.

Lint. or Lintn. Lintner, James Albert.

Ent. Cont. Entomological contributions, I-IV, from the reports on the New York State Cabinet of Natural History. Albany, N. Y. I, Vol. XXIII, 1872; II, Vol. XXIV, 1872; III, Vol. XXVI, 1874; IV, Vol. XXX, 1878.

The paging cited is that of the separates; I and IV are paged separately, II and III as in the reports.

Lucas, Hippolyte.

Mead, Theodore L.

Meigen, Johann Wilhelm.

Syst. Beschr. Schmett. Eur. Systematische Beschreibung der europäischen Schmetterlinge. Aachen, 1827–1832.

Mén. Ménétriés, E.

Schrenk's Reisen. Schrenk Reisen u. Forschungen im Amurlande. Lepidoptera, Petersburg, 1859.

Meyer, Julius.

Minot, Charles Sedgwick.

MOESCHL. Moeschler, Henrich Benno.

MOFFAT, J. Alston.

MOORE, Frederick.

MORR. Morrison, H. K.

N. B. L. Nomen bis lectum. Indicates that the name is preoccupied.

NEUM. Neumoegen, Berthold.

NO. AM. ENT. The North American Entomologist. Buffalo, N. Y. Reinecke & Zesch, 1879–80. One volume only.

OCHS. Ochsenheimer, Ferdinand.

SCHMETT. EUR. Die Schmetterlinge von Europa. Leipzig, 1807–1816. The systema glossatorum is in Vol. IV, 1816.

OLIV. Olivier, Antoine Guillaume.

ENC. METH. Encyclopédie méthodique, dictionnaire des insectes. Paris, 1789–1791 et 1825. Vol. VIII. containing the Noctuids, 1811–1812.

PACIFIC COAST LEP. Pacific Coast Lepidoptera; a series of papers under this title published in the Proc. Cal. Ac. Sci., by Henry Edwards A few of the later as separates only.

PACK. Packard, Alpheus Spring.

GUIDE. Guide to the Study of Insects. 6th edition. New York, Henry Holt & Co., 1878.

PAPILIO, organ of and published by the New York Entomological Club, 1881–1884.

PEARSALL, Richard F.

PILATE, G. R.

PROC. AC. NAT. SCI. PHILA. Proceedings of the Academy of Natural Science of Philadelphia. Published by the Academy.

PROC. AM. PHIL. SOC. Proceedings of the American Philosophical Society, Philadelphia. Published by the Society.

PROC. BOST. SOC. N. H. Proceedings of the Boston Society of Natural History. Published by the Society at Boston, Mass.

PROC. CAL. AC. SCI. Proceedings of the California Academy of Sciences, San Francisco. Published by the Academy.

PROC. DAV. AC. SCI. Proceedings of the Davenport Academy of Sciences. Published by the Academy, Davenport, Iowa.

PROC. ENT. SOC. PHIL. Proceedings of the Entomological Society of Philadelphia. Published by the Society, and succeeded by the Trans. Am. Ent. Soc.

PROC. U. S. NAT. MUS. Proceedings of the United States National Museum, Washington, D. C.

PROC. ZOÖL. SOC. Proceedings of the Zoölogical Society of London. Published by the Society.

PR. SYN. A synonym of the preceding good species.

PSYCHE. Organ of and published by the Cambridge Entomological Club, Cambridge, Mass.

PUT. CRAM. Putman-Cramer, A. W.

REPT. CHIEF ENG. Annual report upon explorations and surveys in the department of the Missouri by E. H. Ruffner, First Lieut. Eng., U. S. A., being Appendix RR. of the annual report of the Chief of Engineers for 1877. Washington, D. C., 1878.

REPT. PEAB. AC. SCI. APP. Annual report of the Peabody Academy of Science—Appendix. Salem, Mass. Published by the Academy. The Appendix contains the descriptive papers.

RILEY, Charles Valentine.

REPT. INS. MO. Annual report on the noxious, beneficial, and other insects of the State of Missouri. 1869–1877. Nine reports. Jefferson City, Mo.

INDEX AND SUPPLT. TO MO. REPTS. General index and supplement to the nine reports on the insects of Missouri. Bulletin No. 6, U. S. Entomological Commission, 1881.

ROB. Robinson, Coleman T.

ROTT. Von Rottenburg, S. A.

NATURF. Naturforscher, Noct., 1776, pp. 111–144.

S. & A. Smith (James Edward) and Abbott (John).

Ins. Ga. The Natural History of the rarer Lepidopterous insects of Georgia, collected from the observations of John Abbott, with the plants on which they feed. London, 1797.

Sagra's Cuba. Ramon de la Sagra. Historia fisica, politica y natural de la Isla de Cuba. Secunda parte: Historia natural: Tom. VII. Crustaceos, Aragnides é Insectos. Paris, 1856. Lepid., pp. 202–313 by Lucas.

Sanb. Sanborn, F. G.

Saund. Saunders, William.

Fruit Ins. Insects injurious to fruits. Philadelphia: Lippincott & Co., 1883.

Say, Thomas.

American Ent., Lec. ed. The complete writings of Thomas Say on the Entomology of North America. Edited by John L. LeConte, New York, 1859.

Schrank, Franz von Paula.

Fn. Boica. Fauna Boica. Nurenberg, 1798–1804, Vols. III, in pts. 6.

Smith, John B.

List Lep. Bor. Am. List of the Lepidoptera of Boreal America: Philadelphia, American Entomological Society, 1891.

Snellen, P. C. T.

Soule & Eliot. Soule, Caroline G., and Eliot, Ida M.

Speyer, Adolph

Staud. Standinger, O.

Cat. Lep. Eur. Catalog der Lepidopteren des europäeischen Faunengebiets, Dresden, 1871.

Steph. Stephens, James Francis.

Ill. Brit. Ent., Haust. Illustrations of British Entomology, or a synopsis of indigenous insects, containing their generic and specific descriptions, with an account of their metamorphoses, time of appearance, localities, food and economy, as far as practicable, with colored figures (from Westwood) of the rarer and more interesting species. Haustellata ii. iii, 1829.

Stett. Ent. Zeit. Entomologische Zeitung, herausgegeben von dem Entomologischen Verein zu Stettin.

Stgr. *See* **Staud.**

Stretch, Richard H.

Zyg and Bomb. Illustrations of the Zygænidæ and Bombycidae of North America. San Francisco, author, 1872–1873.

Strk. or **Strck.** Strecker, Hermann

Lep. Rhop. et Het. Lepidoptera, Rhopaloceres and Heteroceres, Indigenous and exotic, with descriptions and colored illustrations. Reading, Pa., author. 1872–1878.

Sub nom. Under the name of.

S. V. Schiffermüller, Ignaz.

Systematisches Verzeichness der Schmetterlinge der Wiener Gegend, Wien, 1776.

Tausch. Tauscher, A. M.

Tepper, Fred.

Thaxter, Roland.

Thunb. Thunberg, Carl Peter.

Mus. Nat. Ac. Ups. Diss. Museum naturalium Academiæ Upsaliensis. Dissert., 1787–1788.

Diss. Ent. Dissertatio Entomologica novas insectorum species sistens. Upsaliæ, 1781–1791.

Ins. Suec. Dissertatio Entomologica sistens Insecta Suecica. Upsaliæ, 1784–1795.

Tijdschr. voor Entom. Tijdschrift voor Entomologie uitgegeven door de Nederlandsche Entomologische Vereeniging. 's Gravenhage.

Tr. Treitschke, Friedrich.

Schmett. Eur. Die Schmetterlinge von Europa, vol. v, 1825. Leipzig. A continuation of Ochsenheimer's work; vol. v includes the Noctuidæ and is the only volume cited here.

Trans. Am. Ent. Soc. Transactions of the American Entomological Society. Published by the society. Philadelphia. Succeeds the Proc. Ent. Soc., Philadelphia.

Trans. Ent. Soc. Lond. Transactions of the Entomological Society of London. Published by the society.

Trans. Kans. Ac. Sci. Transactions of the Kansas Academy of Science. Topeka. Published by the Academy.

TRANS. NOV. SC. INST. NAT. SCI. Transactions of the Nova Scotia Institute of Natural Sciences. Published by the Institute.

VERH. K. K. ZOOL.-BOT. GES. Verhandlungen der koenig.-kaiserlichen zoologisch-botanischen Gesellschaft in Wien. Published by the society. Vienna.

VETENSK. ACAD. HANDL. Kongl. Vetenskaps Academiens Handlingar, Stockholm. Published by the Academy.

WALLENG. *See* WALLGR.

WALLGR. Wallengren, H. D. J.

WEEKS, Archibald C.

WESTW. Westwood, John Obadiah.

WESTW. ED. DRU. Drury, illustrations, etc., q. v. Edited by J. O. Westwood, London, 1837–1842.

WHEELER'S REPT. SURV. WEST 100 MERID. Report upon geographical and geological explorations and surveys west of the 100th meridian, in charge of First Lieut. George M. Wheeler, Corps of Engineers, U. S. Army, under the direction of Brig. Gen. A. A. Humphreys, Chief of Engineers, U. S. Army. Washington, D. C., 1875.

WIEN. ENT. MONATSCHR. Wiener Entomologische Monatschrift. Vienna. Not a society publication.

WLK. Walker, Francis.

WOOD, William.

INDEX ENT. Index Entomologicus, or a complete illustrated catalogue of the Lepidopterous insects of Great Britain, consisting of 1,946 figures. London, 1833–1839.

WORTH. Worthington, C. E.

W. V. Wiener Verzeichniss. See S. V.

ZELL. Zeller, Philipp Christoph.

ZETT. Zetterstedt, Johann Wilhelm.

INS. LAP. Insecta Lapponica descripta. Lipsiæ, 1840. The Lepidoptera appeared in 1839.

CATALOGUE.

Family THYATIRIDÆ.

Genus **THYATIRA** Ochs.

1816. Ochs., Schmett. Eur., IV, 77.

T. scripta Gosse.*

1840. Gosse, Canadian Naturalist, 249, *Thyatira*.
1856. Wlk., C. B. Mus., Het., IX, 6, *Gonophora*.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, *Gonophora*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 77, *Habrosyne*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 129, *Habrosyne*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 108, *Thyatira*.
1881. Grt., Can. Ent., XIII, 152, *Habrosyne*.
1883. Thaxter, Papilio, III, 10, larva on raspberry.
abrasa Gn.
1852. Gn., Spec. Gen. Noct., I, 12, pl. 3, f. 2, *Thyatira*.
1856. Wlk., C. B. Mus., Het., IX, 6, pr. syn.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, pr. syn.
derasa ‡ Edw.
1873. Edw., Proc. Cal. Ac. Sci., V, 189, *Thyatira*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 5, pr. syn.

HABITAT.—United States generally, northward to Alaska. Northern States in June; British Columbia, July and August.

I refer this species to *Thyatira* because I have not been able to find any essential differences between it and *batis*. The type of maculation is quite distinct, but does not suffice for generic separation. In the Edwards collection there is an Alaskan specimen, and in the British Museum one from Hudson Bay Territory, which indicate a new species. They are much darker in color, and in the course of the t. a. line agree with *derasa* rather than with *scripta*.

Genus **EUTHYATIRA** Smith.

1891. Smith, List Lepidoptera 34.

E. lorata Grt.

1881. Grt., Papilio, I, 75, *Thyatira*.
1882. Grt., Ill. Essay, 48, pl. I, f. 2, *Thyatira*.
1891. Smith, List Lepidoptera, 34, *Euthyatira*

HABITAT.—Washington.

The type is in Mr. Neumœgen's collection. In proposing the genus *Euthyatira* for the two species here associated, I wish to express my conviction that the American species heretofore referred to *Thyatira* are not at all congeneric with *batis*, the type of the genus. There is a certain similarity in the type of maculation, but none in wing form or in other details.

E. pudens Gn.*

1852. Gn., Spec. Gen., Noct. I, 13, pl. III, f. 1, *Thyatira*.
1856. Wlk., C. B. Mus., Het., IX, 8, *Thyatira*.
1874. Strk., Lep. Rhop. et Het., 79, *Thyatira*.
1889. Dyar, Can. Ent. XXI, 209, larva.
1891. Smith, List Lepidoptera, 34, *Euthyatira*.
anticostiensis Grt.

HABITAT.—Pennsylvania, northward to Labrador; Anticosti; Newfoundland; Canada in May; New York in July.

The type of *pudens* is in the British Museum. I can not find that *anticostiensis* has been characterized except by name in Mr. Grote's list of 1890.

Genus **PSEUDOTHYATIRA** Grt.

1864. Grt., Proc. Ent. Soc. Phil., III, 539.

P. cymatophoroides Gn.*

1852. Gn., Spec. Gen. Noct., I, 13, *Thyatira*.
1856. Wlk., C. B., Mus., Het., IX, 8, ? *Thyatira*.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, *Lacinia*.
1863. Grt., Proc. Ent. Soc. Phil., II, 134, *Lacinia*.
1863. Grt., Proc. Ent. Soc. Phil., II, 337, *Lacinia*.
1864. Grt., Proc. Ent. Soc. Phil., III, 539, *Pseudothyatira*.
1875. Morr., Psyche, I, 41, *Pseudothyatira*.
1881. Grt., Can. Ent. XIII, 152, *Pseudothyatira*.
1883. Thaxter, Papilio, III, 10, larva on red oak.
var. expultrix, Grt.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, pl. II, f. 6, *Lacinia*.
1863. Grt., Proc. Ent. Soc. Phil., II, 134, larva.
1863. Grt., Proc. Ent. Soc. Phil., II, 337, an sp. dist. pr.
1864. Grt., Proc. Ent. Soc. Phil., III, 539, an sp. dist. pr.
1882. Grt., New List, 22, an var. pr.
cymatophoroides ♀ Gn.
1852. Gn., Spec. Gen., Noct., I, 14, *Thyatira*.
1856. Wlk., C. B., Mus., Het., IX, 8, var. β.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, =*expultrix*.
1873. Hy. Edw., Proc. Cal. Ac. Sci., V, 189, *Thyatira*.

HABITAT.—West Virginia; Pennsylvania, northward to Nova Scotia; British Columbia; Colorado; New Mexico; Canada, June and July; New York, May, July, August.

The types are in the British Museum, both of the species and the variety. In the museum of the Boston Society of Natural History a specimen in the Harris collection is marked *Noctua cingulata*.

Genus **BOMBYCIA** Hbn.

1816. Hübner, Tentamen.

I follow Mr. Grote in the use of this Hübnerian term, because *Cymatophora* has been used in the Geometridæ, and the term has become confusing. It is quite certain that our species are not congeneric; but all are very rare, and I have never had any material for study.

B. improvisa Hy. Edw.

1873. Hy. Edw., Proc. Cal. Ac. Sci., v, 189, *Cymatophora.*
1874. Grt., Can. Ent., vi, 154, *Bombycia.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., iii, 78, *Bombycia.*
1876. Grt., Stett. Ent. Zeit., xxxvii, 134, *Bombycia.*
1881. Grt., Papilio, i, 76, *Bombycia.*

HABITAT.—Washington.

The type is in the Edwards collection.

B. semicircularis Grt.

1881. Grt., Papilio, i, 75, *Bombycia.*
1882. Grt., Ill. Essav, 48, pl. i, f. 1, *Bombycia.*

HABITAT.—Washington.

The type is in the Neumoegen collection.

B. tearlii Hy. Edw.*

1886. Hy. Edw., Ent. Amer., ii, 11, *Gluphisia.*
1888. Hy. Edw., Ent. Amer., iv, 63, *Bombycia.*
1891. Smith, List Lepidoptera, 34, *Bombycia.*

HABITAT.—California, September and October.
The type is in the Edwards collection.

B. magnifica Strk.

1876. Strk., Proc. Ac. Nat. Sci. Phil., xxviii, 151, *Cymatophora.*
1891. Smith, List Lepidoptera, 34, *Bombycia.*

HABITAT.—Florida.
Mr. Strecker probably has his own type.

B. candida Smith.

1890. Smith, Ent. Amer., vi, 179, *Bombycia.*

HABITAT.—Florida.
The type is in Mrs. Slosson's collection.

B. caniplaga Wlk.

1856. Wlk., C. B. Mus., Het., ix, 18, *Cymatophora.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 5, *Bombycia.*

HABITAT.—Canada.
The type is in the Saunders collection at Oxford, England. A figure sent me by Mr. Schaus proves it to be=*Edema transversata* Wlk.=*Ellida gelida* Grt.

Genus **LEPTINA**, Gn.

1852. Gn., Spec. Gen. Noct., I, 14.

The types of all the species in this genus, with the exception of *latebricola*, Grt., are in the British Museum. *Latebricola* type, is in the collection of the American Entomological Society, and is, as Mr. Grote suggests, the same as *dormitans*. On the other hand, *australis* is not, as I had supposed from specimens named by Mr. Grote, the same as *ophthalmica*, but probably a good species. Mr. Grote has mixed varietal forms of Guenée's species with his own. As the matter stands now, after studying all the types, the species divide as follows:

Shoulders and base of primaries concolorous........................DORMITANS.
Shoulders and base of primaries white.
  Median lines complete, even, white...........................DOUBLEDAYI.
  T. p. line incomplete, reniform distinct.......................OPHTHALMICA.
  T. p. line wanting, reniform wanting..............................AUSTRALIS.

L. dormitans Gn.*

1852. Gn., Spec. Gen., Noct., I, 15, *Leptina*.
1856. Wlk., C. B. Mus., Het., IX, 10, *Leptina*.
1863. Grt., Proc. Ent. Soc. Phil., II, 57, *Leptina*.
latebricola Grt.
1863. Grt., Proc. Ent. Soc. Phil., II, 57, *Leptina*.
1881. Grt., Can. Ent., XIII, 152, *Leptina*.
1890. Grt., Revised Check List, 1, ? pr. syn.

HABITAT.—Canada; Maine; Rhode Island; New York; New Jersey; Wisconsin.

L. doubledayi Gn.*

1852. Gn., Spec. Gen., Noct., I, 15, *Leptina*.
1856. Wlk., C. B. Mus., Het., IX, 10, *Leptina*.
1863. Grt., Proc. Ent. Soc. Phil., II, 58, *Leptina*.

HABITAT.—Maine; Massachusetts in June; New York; Pennsylvania.

L. ophthalmica Gn.*

1852. Gn., Spec. Gen., Noct., I, 15, pl. 3, f. 6, *Leptina*.
1856. Wlk., C. B. Mus., Het., IX, 10, *Leptina*.
1863. Grt., Proc. Ent. Soc. Phil., II, 57, *Leptina*.

HABITAT.—New York in June; Massachusetts in June; Wisconsin.

L. australis Grt. *

1881. Grt., Can. Ent., XIII, 152, an var., *ophthalmica*.
1882. Grt., New List, 22, an spec. dist.
1891. Smith, List Lepidoptera, 34=*ophthalmica*.

HABITAT.—Texas, Alabama.

Family NOCTUIDÆ.

Genus **PANTHEA** Hbn.

1816. Hübner, Verzeichniss, 203.

I use this term to replace *Audela*, *Platycerura*, and in part *Charadra* as used by Mr. Grote. The species are structurally identical with the European *cœnobita*, and one species—*acronyctoides*—has also practically the same type of markings.

P. acronyctoides Wlk.

1861. Wlk., Can. Nat. and Geol., VI., 37, *Audela*.
1877. Grt., Can. Ent., IX, 27, *Audela*.
1878. Grt., Bull. Geol. Surv., IV, 169, *Audela*.
1891. Smith, List Lepidoptera, 34, *Panthea*.
cucomelana Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 428, *Panthea*.
1878. Grt., Bull. Geol. Surv., IV, 169, pr. syn.

HABITAT.—Canada; River Rouge in June; Maine; Massachusetts; New York; Wisconsin.

Mr. Morrison's type is in the Tepper collection; Mr. Walker's is in the collection of the Entomological Society of Ontario, *fide* Grote. The references were made by Mr. Grote after seeing both types.

P. furcilla Pack.

1864. Pack., Proc. Ent. Soc. Phil., III, 374, *Platycerura*.
1873. Stretch, Zyg. & Bomb., 230, pl. 9, f. 15, *Platycerura*.
1874. Lint., Ent., Cont., III, 131 f. 7, larva.
1881. Grt., Bull. Geol. Surv., VI, 258, 277, *Platycerura*.
1883. Thaxter, Papilio, III, 11, larva.
1891. Smith, List Lepidoptera, 34, *Panthea*.

HABITAT.—Canada; Eastern and Middle States; Minnesota; New York in June.

The type of this species is in the Museum of Comparative Zoölogy at Cambridge.

P. gigantea French.

1890. French, Can. Ent., XXII, 134, *Platycerura*.
1891. Smith, List Lepidoptera, 34, *Panthea*.

HABITAT.—Colorado, Texas.

Prof. French has his own type. I had seen specimens in the Edwards collection, but had considered them local forms of *furcilla*.

P. palata Grt.

1880. Grt., Can. Ent., XII, 258, *Charadra*.
1881. Grt., Papilio, I, 153, *Charadra*.
1891. Smith, List Lepidoptera, 34, *Panthea*.

HABITAT.—Colorado; Arizona.

The type is in the British Museum. Mr. Butler has it under *Platycerura*.

Genus **DEMAS** Steph.

1829. Steph., Ill. Br. Ent., Haust., II, 59.

D. propinquilinea Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 293, *Charadra*.
1881. Goodell, Papilio, I, 15, larva.
1885. Dimmock, A. K., Psyche, IV, 274, larva.
flavicornis Smith.
1884. Smith, Bull. Bkln. Ent. Soc., VII, 3, *Demas*.

HABITAT.—Maine in July; Massachusetts in June; Rhode Island and New York in May and July; New Jersey in May.

Mr. Grote's type is in the British Museum, and is, as I have for some time suspected, my *flavicornis*, the type of which is with Mr. Graef. I had seen *propinquilinea*, I believe, in Mr. Thaxter's collection, but the specimens were very much more sharply marked than the one which became my type. My generic reference holds good.

Genus **RAPHIA** Hbn.

1816. Hbn., Verzeichniss, 212.

R. abrupta Grt.

1863. Grt., Proc. Ent. Soc. Phil., II, 336, pl. 8, f. 3, *Raphia*.

HABITAT.—Canada, in June, to Texas; Colorado.

The type is in the British Museum.

R. frater Grt.

1863. Grt., Proc. Ent. Soc. Phil., II, 435, pl. 9, f. 7, *Raphia*.
1883. Thaxter, Papilio, III, 13, larva on poplar.
personata Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 606, *Saligena*.
1868. G. and R., Trans. Am. Ent. Soc., II, 86, pr. syn.
var **coloradensis** Put. Cram.
1886. Cramer, Ent. Amer., II, 142, *Raphia*.
pallula Hy. Edw.
1886. Hy. Edw., Ent. Amer., II, 168, *Raphia*.
1891. Smith, List Lepidoptera, 34, pr. syn.

HABITAT.—Canada to Texas; Colorado; Northern States, and Canada in June and July.

The Grote and Walker types are in the British Museum. Mr. Cramer's type is in the Doll collection, and the type of *pallula* is in the Edwards collection. I have seen all the types and the above synonymy is correct, I believe. The *Raphia onychina* Gn., was described as *Epunda*, referred to *Raphia* by Walker and to *Cleoceris* by Grote. This has resulted in a duplication of the name in my list of Lepidoptera.

Genus **CHARADRA** Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 445.

C. deridens Gn.

1852. Gn., Spec. Gen., Noct., I, 35, pl. 3, f. 8, *Diphtera*.
1856. Wlk., C. B. Mus., Het., IX, 36, *Diphtera*.

1868. G. and R., Trans. Am. Ent. Soc., II, 86, *Charadra.*
1870. Saund., Can. Ent., II, 145, larva.
1874. Lint., Ent. Cont., III, 157, f. 12, larva.
1883. Thaxter, Papilio, III, 11, life hist.
1885. Dimmock, A. K., Psyche, IV, 274, on *Betula.*
circulifera Wlk.
1857. Wlk., C. B. Mus., Het., XI, 709, *Acronycta.*
1868. G. and R., Trans. Am. Ent. Soc., II, 78, pr. syn.
1882. Grt., Ill. Essay, 39, pr. syn.
contigua Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 446, *Charadra.*
1868. G. and R., Trans. Am. Ent. Soc., II, 86, pr. syn.

HABITAT.—Canada to Georgia, Florida and Texas; Colorado; New York in May; Maine and Massachusetts in July; Canada in February.

All the types are in the British Museum, and have been already correctly referred by Messrs. Grote and Robinson.

C. dispulsa Morr.*

1874. Morr., Proc. Bost. Soc., N. H., XVII, 213, *Charadra.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 4, *Charadra.*

HABITAT.—Texas in March, May, June, August, October.

I do not know where the type is to be found; the species is well known.

C. decora Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 55, *Charadra.*

HABITAT.—California.

I do not know this species, which must be a striking one from the description. Mr. Grote has for some reason omitted it from all his lists.

Genus FERALIA Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 58.

F. jocosa Gn.*

1852. Gn., Spec. Gen., Noct., I, 37, *Diphtera.*
1856. Wlk., C. B. Mus., Het., IX, 56, *Diphtera.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 58, *Feralia.*
1875. Grt., Stett. Ent. Zeit., XXXVI, 195, *Feralia.*
1883. Grt., Can. Ent., XV, 28, *Feralia.*
fallax ‡ G. and R.
1868. G. and R., Trans. Am. Ent. Soc., II, 77, *Moma.*

HABITAT.—New Hampshire; New York: New Jersey in March.

The type is in the British Museum.

F. februalis Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 60, *Feralia.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 310, *Arthrochlora.*
1875. Grt., Stett. Ent. Zeit., XXXVI, 197, *Arthrochlora.*

HABITAT.—California.

Types are in the British Museum and in the Edwards collection.

F. **major** Smith.*

1890. Smith, Ent. Amer., VI, 26, *Feralia*.

HABITAT.—New Hampshire; Plattsburg, New York, April and May; District of Columbia.

Types are in the National Museum.

Genus **MOMOPHANA** Grt.

1875. Grt., Stett. Ent. Zeit., XXXVI, 195.

M. **comstocki** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 59, *Feralia*.
1875. Grt., Stett. Ent. Zeit., XXXVI, 195, *Momophana*.

HABITAT.—New York in May; Canada.

The type is with Prof. Comstock at Ithaca, N. Y.

Genus **MOMA** Hbn.

1816. Hbn., Verzeichniss, 203.

M. **fallax** H. Sch.*

1853. H. Sch., Exot. Schmett., 80, f. 211, *Moma*.
1856. Wlk., C. B. Mus., Het., IX, 35, *Diphtera*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 213, *Diphthera*.
1881. Grt., Bull. Geol. Surv., VI, 277, *Diphthera*.
1882. Smith, Bull. Bkln. Ent. Soc., V, 43, *Moma*.

HABITAT.—Canada in July; New York, in July and August, to District of Columbia; Tennessee; Illinois; Texas in March, April, July.

I do not know where the type of this species can be found.

Genus **ARSILONCHE** Led.

1857. Lederer, Noct. Eur., 70.

A. **albovenosa** Goeze.*

1781. Goeze. Ent. Beitr., III, 3, p. 251, *Noctua*.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 428, *Arsilonche*.
1876. Harv., Can. Ent., VIII, 35, *Arsilonche*.
1880. Coquillett, Can. Ent., XII, 44, larva on *Polygonum*.
1883. Grt., Can. Ent., XV, 30, *Arsilonche*.
1887. Hy. Edw., Ent. Amer., III, 168, larva on *Polygonum*.
ab. **fumosum** Morr.
1873. Morr., Bull. Buff. Soc. Nat. Sci., I, 275, *Arsilonche*.
1875. Morr., Proc. Ac. Nat. Sci., Phil., 1875, 428, *Arsilonche*.
var. **henrici** Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 10, *Leucania*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 152, Pl. I, f. 15, *Ablepharon*.
1875. Thaxter, Psyche, I, 188, larva on grass.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 428, pr. syn.
1883. Grt., Can. Ent., XV, 30, *Arsilonche*, sp. dist. pr.
var. **evanidum** Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 10, *Leucania*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 112, Pl. I, f. 16, *Ablepharon*.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 428, pr. syn.

HABITAT.—Canada in May and June; Northern, Eastern, Middle, and Central States; Massachusetts in April; Kansas and California in January.

Mr. Morrison's type is in the Tepper collection. Mr. Grote's types I have not seen. They may be in the British Museum; but if so I overlooked them. The species has not been critically studied, and the true relation of the forms is yet in doubt. The American form may yet prove distinct, though a very close ally to the European insect. I am not nearly so ready to believe in the identity of European and American species as I once was.

Genus **MEROLONCHE** Grt.

1882, Grt., Ill. Essay, 50.

In this genus and in the following, from which the present has been separated, I have few original notes. Dr. Riley has been accumulating material for several years past for a critical and revisional monograph of the species, and what little I have done is in his hands. Dr. Riley has made comparisons in the European museums, and I did not, therefore, look over the species except as they came accidentally under my notice. So, too, I have given the location of the types only where they are in American collections of which I had notes, or where I accidentally noted the fact. The bibliography, however, is as nearly complete as in most other genera.

M. spinea Grt.

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 78, *Apatela.*
1878. Hy. Edw., Pac. Coast Lep., No. 27, 3, *Acronycta*; larva.
1882. Grt., Ill. Essay, 50, *Merolonche.*
1883. Grt., Papilio, III, 112, *Merolonche.*

HABITAT.—California; Colorado.

The type is in the Edwards collection.

M. lupini Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 79, *Apatela.*
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 78, *Apatela.*
1882. Grt., Ill. Essay, 50, *Merolonche.*
1883. Grt., Papilio, III, 112, *Merolonche.*

HABITAT.—California.

The type is in the Edwards collection.

Genus **ACRONYCTA** Ochs.

1816. Ochs., Schmett., IV, 62.

A. occidentalis G. & R.*

1866. G. & R., Proc. Ent. Soc. Phil., VI, 16, *Acronycta.*
1872. Saund., Can. Ent., IV, 49, larva.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 108, *Acronycta.*
1876. Grt., Ann. Lyc. Nat. Hist., N. Y., XI, 302, *Apatela.*
1882. Packard, Papilio, II, 181, larva.
1883. Grt., Papilio, III, 67, *Apatela.*

1883. Hy. Edw., Papilio, III, 132, larva.
1885. Dimmock, A. K., Psyche, IV, 274, larva.
psi ‡ Gn.
1852. Gn., Spec. Gen., Noct., I, 43, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 42, *Acronycta*.
1866. G. & R., Proc. Ent. Soc. Phil., VI, 16, pr. syn.

HABITAT.—Canada to Virginia; Central States; Illinois in August.

In the Harris collection are specimens of this species marked *sagittaria* Harr., and dated, respectively, April 25, May 25, and June 1. It has been taken in Canada from May to August, and in New York to September.

A. morula G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., II, 196, Pl. III, f. 75, *Acronycta*.
1878. Lintner, Ent. Cont., IV, 137, larva.
1883. Thaxter, Papilio, III, 13, larva.
1883. Grt., Papilio, III, 67, *Apatela*.
spinigera ‡ Wlk.
1856. Wlk., C. B. Mus., Het., IX, 55, *Acronycta*.
1882. Grt., Ill. Essay, 39, pr. syn.
ulmi Harr.
1869. Harris, Ent. Corr., by Scudder, 312, Pl. III, f. 10, larva.
1891. Smith, List Lepidoptera, 35, pr. syn.

HABITAT.—Canada to Virginia, west to the Mississippi Valley; Wisconsin; Minnesota; Canada in June and July; New York in July.

In the Harris collection the specimen marked *ulmi* is *morula* G. & R. It is labeled "Imago, June 11, 1850."

A. lobeliæ Gn.*

1852. Gn., Spec. Gen., Noct., I, 44, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 54, *Acronycta*.
1881. Coquillett, Papilio, I, 6, larva.
1883. Grt., Papilio, III, 68, *Apatela*.
1886. French, Can. Ent., XVIII, 118, larva.

HABITAT.—Canada to Middle, Southern, and Central States; Canada and New York in June and July; Minnesota in August; Texas in March and April; New Jersey in June and August.

A. hasta Gn.*

1852. Gn., Spec. Gen., Noct., I, 45, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 54, *Acronycta*.
1883. Grt., Papilio, III, 67, *Apatela*.

HABITAT.—Middle and Eastern States; Canada in June; Delaware in March and May.

A. telum Gn.

1852. Gn., Spec. Gen., Noct., I, 45, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 54, *Acronycta*.
1883. Grt., Bull. Geol. Surv., VI, 571, *Apatela*.

HABITAT.—"Am. Sept."

This species has not been identified in American collections so far as

A. furcifera Gn.*

1852. Gn., Spec. Gen., Noct., I, 44, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 54, *Acronycta.*
1883. Grt., Papilio, III, 68, *Apatela.*

HABITAT.—New York to Florida, to Illinois.

A. thoracica Grt.

1880. Grt., No. Amer. Ent., I, 94, *Apatela.*
1883. Grt., Papilio, III, 68, *Apatela.*

HABITAT.—Colorado; New Mexico.

A. dentata Grt.*

1875. Grt., Can. Ent., VII, 222, *Apatela.*

HABITAT.—Canada; Eastern and Northern States; Adirondack Mountains in July.

A. grisea Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 56, *Acronycta.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 78, *Acronycta.*
1875. Grt., Can. Ent., VII, 222, *Apatela.*
1882. Grt., Ill. Essay, 39, *Apatela.*
1883. Grt., Papilio, III, 68, *Apatela.*
1883. Hy. Edw., Papilio, III, 131, larva.
pudorata Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 93, *Acronycta.*
1875. Grt., Can. Ent., VII, 221, 222, pr. syn.
1880. Grt., Can. Ent., XII, 188, pr. syn.

HABITAT.—Canada to Southern and Central States; Minnesota in July.

The type of *pudorata* is in the Tepper collection.

A. tritona Hbn.*

1818. Hbn., Zutræge, 21, f. 107, 108, *Triæna.*
1816. Hbn., Verzeichniss, 201, *Triæna.*
1852. Gn., Spec. Gen., Noct., I, 42, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 53, *Acronycta.*
1875. Grt., Can. Ent., VII, 221, *Apatela.*
1880. Grt., Can. Ent., XII, 87, *Apatela.*
1883. Grt., Papilio, III, 68, *Apatela.*

HABITAT.—Canada to Florida; Minnesota; Mississippi; Colorado; Portland, Oregon, in May.

A. betulæ Riley.*

1884. Riley, Bull. Bkln. Ent. Soc., VII, 2, fig., *Acronyota*

HABITAT.—New Jersey; District of Columbia.

The types are in the National Museum.

A. innotata Gn.*

1852. Gn., Spec. Gen., Noct., i, 50, *Acronycta*.
1856. Wlk., C. B. Mus., Het., ix, 59, *Acronycta*.
1883. Grt., Papilio, iii, 114, *Apatela*.
grœfii Grt.
1863. Grt., Proc. Ent. Soc. Phil., ii, 68, pl. iii, f. 6, *Diphthera*.
1875. Morr., Can. Ent., vii, 79, pr. syn.

HABITAT.—Canada; Northern and Eastern States; New York in August; Canada in July; Massachusetts in June.

A. falcula Grt.

1877. Grt., Can. Ent., ix, 86, *Apatela*.
1881. Coquillett, Papilio, i, 6, larva.
1883. Grt., Papilio, iii, 68, *Apatela*.

HABITAT.—Illinois.

A. parallela Grt.

1877. Grt., Can. Ent., ix, 53, *Apatela*
1883. Grt., Papilio, iii, 68, *Apatela*.

HABITAT.—Colorado; Texas.

A. albarufa Grt.*

1874. Grt., Proc. Bost. Soc. N. H., xvi, 239, *Apatela*.
1883. Grt., Papilio, iii, 68, *Apatela*.
walkeri Andrews.
1877. Andrews, Can. Ent., ix, 98, *Acronycta*.
1879. Graef, Bull. Bkln. Ent. Soc., i, 93, pr. syn.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States; Mississippi; New Mexico; Minnesota in June; Massachusetts in July.

A. paupercula Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 197, *Apatela*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 4, *Apatela*.
1883. Grt., Papilio, iii, 68, *Apatela*.

HABITAT.—Texas in March.

A. vinnula Grt.*

1864. Grt., Proc. Ent. Soc. Phil., ii, 436, pl. ix, f. 2, *Microcœlia*.
1868. Grt., Trans. Am. Ent. Soc., ii, 118, *Acronycta*
1883. Grt., Papilio, iii, 68, *Apatela*.

HABITAT.—Canada to Texas: New York in May and August; New Jersey in June.

A. quadrata Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 154, *Apatela*.
1883. Grt., Papilio, iii, 114, *Apatela*.

HABITAT.—Kansas.

A. harveyana Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 418, *Apatela.*
spinigera ‡ Wlk.
1856. Wlk., C. B. Mus., Het., IX, 55, *Acronycta.*
1882. Grt., Ill. Essay, 39, pr. syn.

HABITAT.—New York in June; New Hampshire; Northern and Eastern States.

A. radcliffei Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 270, *Apatela.*
1878. Thaxter, Psyche, II, 121, larva.
1883. Grt., Papilio, III, 114, *Apatela.*

HABITAT.—Massachusetts in June; New Hampshire; New York; Adirondack mountains in August.

A spinigera Gn.*

1852. Gn., Spec. Gen., Noct., I, 45, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 55, *Acronycta.*
1878. Thaxter, Psyche, II, 121, *Apatela.*
1883. Grt., Bull. Geol. Surv., VI, 572, *Apatela.*
1885. Dimmock, A. K., Psyche, IV, 274, larva.

HABITAT.—"New York."

Mr. Grote never positively identified this species. Walker's ***spinigera*** is cited to ***harveyana***, while Mr. Grote says most of the specimens of ***spinigera*** in American collections are ***pallidicoma***. Whether the larvæ mentioned by Thaxter and Dimmock are of this species, or of ***pallidicoma***, or of some other yet unnamed species, is thus left uncertain. May, June, and August are dates given for ***spinigera***.

A. tota Grt.

1879. Grt., North Am. Ent., I, 12, *Apatela.*
1883. Grt., Papilio, III, 69, *Apatela.*

HABITAT.—Texas.

A. felina Grt.

1880. Grt., Bull. Geol. Surv., V, 208, *Apatela.*
1887. French, Can. Ent., XIX, 48, life history.
1889. French, Can. Ent., XXI, 36, *Apatela.*

HABITAT.—California; Colorado, Glenwood Springs in October. The types are in the Tepper and Edwards collections.

A. lepusculina Gn.*

1852. Gn., Spec. Gen., Noct., I, 46, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 55, *Acronycta.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 130, *Apatela.*
1874. Grt., Can. Ent., VI, 154, *Apatela.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VII, 23, larva.
1888. Hy. Edw., Ento. Amer., III, 185, *Apatela.*

HABITAT.—New York (?) to California; Colorado; Hudson's Bay Territory; Riley Co., Kansas, in June.

Guenée gives no definite locality. Mr. Edwards considers the species confined to the Pacific coast.

A. populi Riley.*

1870. Riley, 2d Rept. Ins. Mo., 119, f. 87, 88, *Acronycta*.
1872. Grt., Trans. Am. Ent. Soc., iv, 28, = *lepusculina*.
1881. Riley, Index and Supplt. to Mo. Repts., 74, ? *lepusculina*.
1881. Grt., Papilio, i, 127 = *lepusculina*.
1888. Hy. Edw., Ent. Amer., iii, 185, an sp. dist.
var. **sancta** Hy. Edw.
1888. Hy. Edw., Ento. Amer., iii, 185, pr. var.

HABITAT.—Missouri; New Hampshire; New Brunswick in August; New York in July; Colorado.

Dr. Riley's types are in the National Museum. The type of *sancta* is in the Edwards collection. Probably most of the references to *lepusculina* in local lists should be to this species.

A. vulpina Grt.

1883. Grt., Can. Ent., xv, 8, *Apatela*.
1883. Grt., Papilio, iii, 68, *Apatela*.
1883. Thaxter, Papilio, iii, 15, larva.
1885. Dimmock, A. K., Psyche, iv, 274, larva.
1888. Grt., Can. Ent., xix, 20, *Apatela*.

HABITAT.—Maine; Massachusetts; New York.

A. americana Harr.

1841. Harris, Rept. Ins. Mass., 317, *Acronycta*.
1862. Harris, Ins. Inj. Veg., Flint ed., 436, f. 216–218, *Acronycta*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii 154, *Apatela*.
1881. Coquillett, Papilio, i, 6, larva.
1883. Grt., Papilio, iii, 111, *Apatela*.
1885. Dimmock, A. K., Psyche, iv, 274, food plants.
aceris ‡ S & A.
1797. Sm. & Abb., Ins. Ga., ii, 185, pl. 93, larva.
var. **obscura** Hy. Edw.
1886. Hy. Edw., Ent. Amer., ii, 169, *Apatela*, pr. var.

HABITAT.—Canada to Georgia; west to Utah and Colorado; Canada in June and July; New York also in September.

The type of *obscura* is in the Edwards collection.

A. dactylina Grt.*

1874. Grt., Proc. Bost. Soc. N. H., xvi, 239, *Apatela*.
1875. Morr., Psyche, i, 42, *Apatela*.
1883. Grt., Papilio, iii, 111, *Apatela*.
1885. Dimmock, A. K., Psyche, iv, 274, larva.
1892. Edw., and Elliott, Bull. Am. Mus. Nat. Hist., iv, 77, larva.

HABITAT.—Canada to District of Columbia; west to Colorado; Minnesota; Massachusetts in June; Canada in July.

A. hastulifera S. & A.

1797. S. & A., Ins. Ga., II, 183, pl. 92, *Phalæna*.
1852. Gn., Spec. Gen., Noct., I, 47, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 56, *Acronycta*.
1874. Lintner, Ent. Cont., III, 158, larva.

Habitat.—New York to Georgia; Central States; Canada in June.

A. insita Wlk.

1856. Wlk., C. B. Mus., Het., IX, 61, *Acronycta*.
1883. Grt., Papilio, III, 111, *Apatela*.

Habitat.—Canada; Eastern and Middle States.

A. acericola Gn.

1852. Gn., Spec. Gen., Noct., I, 48, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 57, *Acronycta*.
aceris ‡ S. & A.
1797. S. & A., Ins., Ga., II, 184, pl. 93, *Phalæna*.
1852. Gn., Spec. Gen., Noct., I, 48, pr. syn.
hastulifera ‡ larva, S. & A.
1797. S. & A., Ins. Ga., II, 183, pl. 92, larva.
1852. Gn., Spec. Gen., Noct., I, 48, larva *acericola*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 154, *Acronyc*

Habitat.—Georgia; Virginia.

It is questionable whether the above synonymy can be considered settled; but it is a matter to be determined by the monographer of the genus and not by the catalogue maker.

A. impressa Wlk.

1856. Wlk., C. B. Mus., Het., IX, 61, *Acronycta*.
1882. Grt., Ill. Essay, 38, = *brumosa*.
1887. Butler, Ent. Amer., III, 35, *Acronycta*.
fasciata Wlk.
1856. Wlk., C. B. Mus., Het., IX, 62, *Acronycta*.
1882. Grt., Ill. Essay, 39 = *brumosa*.
1887. Butler, Ent. Amer., III, 35, = *impressa*.
brumosa ‡ Grt., in lists.
1875. Speyer, Stett. Ent., Zeit., XXXVI, 109, *Acronycta*.
1881. Coquillett, Papilio, I, 56, larva.
1883. Saund., Fruit Insects, 313, f, 325, larva.
1885. Dimmock, A. K., Psyche, IV, 274, larva.
1887. Butler, Ent. Amer., III, 35, = *impressa*.
verrillii G. & R.
1870. G. & R., Trans. Am. Ent. Soc., III, 178, pl. ii, f. 82, *Acronycta*.
1875. Morr., Can. Ent., VII, 79 = *A. innotata*.
1875. Morr., Ann. Lyc. Nat. Hist. N. Y., XI, 92 = *brumosa*.
1875. Morr., Psyche, I, 42 = *brumosa*.

Habitat.—Canada to Florida, to Wisconsin, to Mississippi; Central States; Canada, May to August; New York, July and August; Minnesota in June; Glenwood Springs, Colorado, in August.

The type of *verrillii* is in the collection of the American Entomological Society, and is the *brumosa* of the same collection, the latter labeled by Grote. The synonymy above given is after Butler.

A. distans Grt

1879. Grt., Can. Ent., xi, 38, *Apatela*.

HABITAT.—Canada.

A. rubricoma Gn.*

1852. Gn., Spec. Gen., Noct. i, 49, *Acronycta*.
1856. Wlk., C. B. Mus., Het., ix, 57, an sp. dist., *acericola*?

HABITAT.—Canada; Middle and Southern States.

A. luteicoma G. & R.*

1870. G. & R., Trans. Am. Ent. Soc., iii, 179, pl. ii, f. 83, *Acronycta*.
1883. Thaxter, Papilio, iii, 16, *Acronycta*.

HABITAT.—Canada; Northern and Middle States to Colorado; Minnesota in June; Massachusetts in June; Portland, Oregon, in May.

A. impleta Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 57, *Acronycta*.
subochrea Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 153, *Acronycta*.
1875. Grt., Can. Ent., vii, 227, pl. i, f. 10, *Apatela*.
1887. Butler, Ent. Amer., iii, 36, pr. syn.

HABITAT.—Canada in July; Eastern, Middle and Central States; New York in May and June.

A. perdita Grt.*

1874. Grt., Can. Ent., vi, 154, *Acronycta*.

HABITAT.—California in June.

A. afflicta Grt.*

1864. Grt., Proc. Ent. Soc. Phil., ii, 438, pl. ix, f. 4, *Acronycta*.
1870. Grt., Trans. Am. Ent. Soc., iii, 179, *Acronycta*.
1883. Thaxter, Papilio, iii, 17, larva.

HABITAT.—Middle, Southern and Central States; Massachusetts in June; Texas in March; Canada.

A. noctivaga Grt.*

1864. Grt., Proc. Ent. Soc. Phil., ii, 437, pl. ix, f. 3, *Acronycta*.
1869. Bethune, Can. Ent., i, 71, *Acronycta*.
1883. Thaxter, Papilio, iii, 15, life history.
longa ‡ Wlk.
1856. Wlk., C. B. Mus., Het., ix, 60, *Acronycta*.
1868. G. & R., Trans. Am. Ent. Soc., ii, 77, pr. syn.
1887. Butler, Ent. Amer., iii, 36, pr. syn.

Habitat.—Canada to Southern and Central States; Colorado; New Mexico; Canada, June to August; Massachusetts and New York, May and June; Portland, Oregon, April and May.

Mr. Grote's type is in the collection of the American Entomological Society.

A. brumosa Gn.*

1852. Gn., Spec. Gen., Noct., I, 52, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 59, *Acronycta.*
longa Gn.
1852. Gn., Spec. Gen., Noct., I, 54, *Acronycta.*
1869. Bethune, Can. Ent., I, 71, *Acronycta.*
1887. Butler, Ent. Amer., III, 36, pr. syn.
persuasa Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 271, *Apatela.*
1887. Butler, Ent. Amer., III, 36, pr. syn.

Habitat.—Southern States; Colorado; New Mexico; Texas in March.

Mr. Butler does not make the reference of *longa* to *brumosa* very positively and does so without a comparison of types.

A. superans Gn.*

1852. Gn., Spec. Gen., Noct., I, 53, *Acronycta.*
1856. Wlk., C. B. Mus., Het., IX, 56, *Acronycta.*
1869. Bethune, Can. Ent., I, 85, *Acronycta.*
1875. Morr., Psyche, I, 42, *Apatela.*
1881. Coquillett, Papilio, I, 6, larva.
1883. Saunders, Fruit Insects, 166, f. 174, 175, larva.

Habitat.—Canada; Eastern, Middle, and Central States; Canada and New York, June and July.

A. connecta Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 79, *Acronycta.*

Habitat.—Canada; Northern, Eastern, Middle, and Central States; Canada in August.

A. funeralis G. & R.

1866. G. & R., Proc. Ent. Soc. Phil., VI, 17, pl. iii, f. 8, *Acronycta.*
1870. G. & R., Trans. Am. Ent. Soc. III, 179, *Acronycta.*
1874. Lintner, Ent. Cont., III, 135, 157, larva sub nom., *americana.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 111, *Acronycta.*
1875. Grt., Check List, Noct., pl. f. 1, *Apatela.*
1883. Grt., Papilio, III, 111, *Jochearea.*
americana ‡ Harr.
1869. Harris, Ent. Corr., 313, pl. iii, f. 3, larva only.
1874. Lintner, Ent. Cont., III, 157, pr. syn.

Habitat.—Maine to Iowa; Eastern, Middle, and Central States.

A. ovata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 80, pl. ii, f. 14, *Acronycta.*
1883. Grt., Papilio, III, 112, *Lepitoreuma.*

HABITAT.—New York to Texas; Central States; Northern States in June; Texas in July.

The type is in the collection of the American Entomological Society.

A. modica Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 56, *Acronycta*.
1887. Butler, Ent. Amer., III, 36, *Acronycta*.
exilis Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 197, *Acronycta*
1883. Grt., Papilio, III, 112, *Lepitoreuma*.
1887. Butler, Ent. Amer., III, 36, pr. syn.

HABITAT.—Massachusetts to Minnesota to Texas; Northern States in June.

A. increta Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 131, *Acronycta*.
1883. Grt., Papilio, III, 112, *Lepitoreuma*.

HABITAT.—Middle States, New Mexico.

The type is in the Tepper collection.

A. hamamelis Gn.*

1852. Gn., Spec. Gen., Noct., I, 52, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 59, *Acronycta*.
1877. Good., Can. Ent., IX, 61, larva.
1883. Grt., Papilio, III, 112, *Lepitoreuma*.
1887. Butler, Ent. Amer., III, 36, *Acronycta*.
clarescens Gn., nec Grt.
1852. Gn., Spec. Gen., Noct., I, 54, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 60, *Acronycta*.
1887. Butler, Ent. Amer:, III, 36, pr. syn.

HABITAT.—Canada to Texas; Central States. Northern States, June and July; Texas, March, April, and July.

A. hæsitata Grt.

1882. Grt., Bull. Geol. Surv., VI, 575, *Apatela*.
1883. Grt., Papilio, III, 112, *Lepitoreuma*.

HABITAT.—Canada; New York to Texas; Central States.

A. pruni Harr.

1869. Harris, Ent. Corr., by Scudder, 313, pl. IV, f. 13, larva.
clarescens; Grt., in lists et coll.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 4, *Apatela*.
1887. Butler, Ent. Amer., III, 36, not *clarescens* Gn.

HABITAT.—Nova Scotia to Southern and Central States.

The Harris specimens are in the collection of the Boston society, numbered 32. They are undoubtedly what Mr. Grote has named *clarescens* in American collections, but which Mr. Butler shows is not Guenée's species. As Mr. Grote's determination is incorrect, the species is nameless and Dr. Harris's name becomes available.

A. retardata Wlk.*

1861. Wlk., Can. Nat. and Geol., VI, 38, ? *Microcœlia.*
1877. Grt., Can. Ent., IX, 26 = *dissecta.*
dissecta G. & R.
1870. G. & R., Trans. Am. Ent. Soc., III, 178, pl. ii, f. 81, *Acronycta.*
1883. Grt., Papilio, III, 113, *Lepitoreuma.*

HABITAT.—Canada, Northern, Eastern, Middle, and Central States. Canada and Northern States, June and July.

The type of *dissecta* is in the collection of the American Entomological Society. Mr. Grote himself stated the identity of *dissecta* with *retardata*, yet nevertheless continued to use the former term. The type of *retardata* is in the collection of the Entomological Society of Ontario.

A. sperata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 81, pl. ii, f. 1, *Acronycta.*
1883. Grt., Papilio, III, 113, *Arctomyscis.*

HABITAT.—Eastern, Middle, and Central States, to Colorado; Northern States, May to August; Canada.

The type is in the collection of the American Entomological Society.

A. edolata Grt.*

1881. Grt., Papilio, I, 153, *Apatela.*
1882. Grt., Ill. Essay, 49, pl. i, f. 4, *Mastiphanes.*

HABITAT.—Arizona; Colorado.

A. extricata Grt.

1882. Grt., Bull. Geol. Surv., VI, 575, *Apatela.*
1883. Grt., Papilio, III, 113, *Mastiphanes.*

HABITAT.—Texas.

A. pallidicoma Grt.*

1878. Grt., Bull. Geol. Surv., IV, 169, *Apatela.*

HABITAT.—Eastern, Middle, and Central States to Kansas; Canada in May, June, and August.

A. xyliniformis Gn.*

1852. Gn., Spec. Gen., Noct., I, 56, *Acronycta xylinoides.*
1852. Gn., Spec. Gen., Noct., III, 400, *xyliniformis.*
1856. Wlk., C. B. Mus., Het., IX, 60, *Acronycta.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 81, note 11, *xylinoides.*
1873. Riley, 5th Rept. Ins. Mo., 126, *xylinoides*, larva.
1885. Dimmock, A. K., Psyche, IV, 274, *Apatela.*

HABITAT.—New York to Florida; Texas in July and August.

A. lithospila Grt.*

1874. Grt., Proc. Bost. Soc. N. H., XVI, 240, *Acronycta.*
1883. Hy. Edw., Papilio, III, 132, larva.

HABITAT.—Northern, Middle, and Central States; Massachusetts in June.

A. oblinita S. & A.*

1797. S. & A., Ins. Ga., II, 187, pl. 94, *Phalæna*.
1852. Gn., Spec. Gen., Noct., I, 49, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 58, *Acronycta*.
1871. Saund., Can. Ent., III, 226, figd.
1871. Riley, Amer. Ent., II, 341, f. 210, larva.
1871. Riley, 3d Rept., Ins. Mo., 70, f. 29, 30, all stages.
1874. Lintner, Ent. Cont., III, 159, larva.
1875. Gentry, Proc. Ac. Nat. Sci. Phil., 1875, 24, larva.
1878. Goodell, Can. Ent., X, 66, larva.
1882. Grt., Papilio, II, 99, larva.
1883. Grt., Papilio, III, 113, *Eulonche*.
1883. Saund., Fruit Ins., 325, f. 337, all stages.

HABITAT.—Nova Scotia to Florida; Central States, May to August; Northern States, May to August; Riley Co., Kansas, in May.

This species has quite a large economic bibliography, which is partly given in Mr. Edwards's catalogue of early stages.

A. lanceolaria Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 418, *Apatela*.
1882. Grt., Ill. Essay, 50, pl. I, f. 7, *Eulonche*.
1883. Grt., Papilio, III, 113, *Eulonche*.

HABITAT.—Massachusetts in August.

The type is in the British Museum.

A. insolita Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 82, *Acronycta*.
1883. Grt., Papilio, III, 113, *Eulonche*.

HABITAT.—Middle States.

The type is in the British Museum.

A. interrupta Gn.

1852. Gn., Spec. Gen., Noct., I, 46, *Acronycta*.
1856. Wlk., C. B. Mus., Het., IX, 55, *Acronycta*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 78, note 4, *Acronycta*.

HABITAT.—"Georgia; Am. Sept."

This has not been identified in American collections; it was described from a figure by Abbot, and Guenée expresses himself as uncertain whether it really belongs to this genus.

A. declarata Wlk.

1856. Wlk., C. B. Mus., Het., IX, 61, *Acronycta*.

HABITAT.—Canada.

Described as a black species with white markings, and probably not an *Acronycta* at all. I did not see it in the British Museum.

[Since the above note went to the printer, Mr. Schaus has sent me a very good figure made from the type, which is at Oxford, which proves the species to be *Mamestra adjuncta* Bdv., the latter name taking precedence.]

A. simplex Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 618, *Acronycta.*

HABITAT.—Vancouver.

To Mr. Butler's kindness I owe a rough sketch of this species which shows a form totally unlike any known to me, and looks rather like a pale Hadenid than an *Acronycta.* [It is *Xylomiges crucialis.*]

A. salicis Harr.

1869. Harr., Ent. Cont., 314, f. 44, larva only.

HABITAT.—Massachusetts.

Described from the larva only. I have no note of seeing any specimens under this name in the Harris collection.

Genus **HARRISIMEMNA** Grt.
1873. Grt., Trans. Am. Ent. Soc., IV, 293.

H. trisignata Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 29, *Grammophora.*
1873. Grt., Trans. Am. Ent. Soc., IV, 293, *Harrisimemna.*
1882. Grt., Ill. Essay, 49, pl. i, f. 3, *Harrisimemna.*
1886. Goodhue, Can. Ent., XVIII, 58, larva on lilac.
sexguttata Harr.
1869. Harr., Ent. Corr., 174, f. 24, 25, *Notodonta.*
1873. Grt., Trans. Am. Ent. Soc., IV, 293, pr. syn.

HABITAT.—Canada in July; New York; Pennsylvania; Massachusetts in June; Texas.

Walker's type is in the British Museum.

Genus **CERMA** Hbn.
1816. Hbn., Verzeichniss, 207.

C. cora Hbn.*

1818. Hbn., Zutræge, I, 14, ff. 59, 60, *Cerma.*
1816. Hbn., Verzeichniss, 207, *Cerma.*
1852. Gn., Spec. Gen., Noct., I, 31, *Grammophora.*
1856. Wlk., C. B. Mus., Het., IX, 29, *Grammophora.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 14, *Lamprosticta.*
1880. Grt., Can. Ent., XII, 86, *Cerma.*
1882. Smith, Bull. Bkln. Ent. Soc., V, 38, *Bryophila.*
festa Gn.
1852. Gn., Spec. Gen., Noct., II, 57, pl. 7, f. 5, *Chariptera.*
1857. Wlk., C. B. Mus., Het., XI, 535, *Lamprosticta.*
1880. Grt., Can. Ent., XII, 86, pr. syn.
1881. Grt., Bull. Geol. Surv., VI, 570, pr. syn.?

HABITAT.—Canada; Maine to Georgia.

The species was described from the Guerin collection by Guenée, and I have not seen the type.

C. **olivacea** Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 103, *Cerma*.

HABITAT.—Colorado, Glenwood Springs, September and October; Sierra Nevada, California.

Types are in the National Museum and in the Edwards collection.

Genus **POLYGRAMMATE** Hbn.

1816. Hbn., Verzeichniss, 203.

P. **hebraicum** Hbn.*

1818. Hbn., Zutræge, I, 10, ff. 25, 26, *Polygrammate*.
1816. Hbn., Verzeichniss, 203, *Polygrammate*.
1880. Grt., Can. Ent., XII, 85, *Polygrammate*.
1882. Smith, Bull. Bkln. Ent. Soc., V, 30, *Bryophila*.
hebræa Gn.
1852. Gn., Spec. Gen., Noct., I, 31, pl. 3, f. 5, *Grammophora*.
1856. Wlk., C. B. Mus., Het., IX, 29, pr. syn.

HABITAT.—Massachusetts, in July; New York; District of Columbia in August; Florida; Texas.

Genus **MICROCŒLIA** Gn.

1852. Gn., Spec. Gen., Noct., I, 33.

M. **fragilis** Gn.*

1852. Gn., Spec. Gen., Noct., I, 34, *Microcœlia*.
1856. Wlk., C. B. Mus., Het., IX, 31, *Microcœlia*.
1864. Grt., Proc. Ent. Soc. Phil., III, 80, *Microcœlia*.
1875. Morr., Psyche, I, 42, *Microcœlia*.
spectans Wlk.
1861. Wlk., Can. Nat. and Geol., VI, 38, ? *Bryophila*.
1877. Grt., Can. Ent., IX, 27, pr. syn.

HABITAT.—Canada in June and July; Northern, Middle, and Central States; Northern States in July and August.

Gueneé's type is in the British Museum; Walker's species is in the collection of the Entomological Society of Ontario, and was compared by Mr. Grote.

M. **diphteroides** Gn.*

1852. Gn., Spec. Gen., Noct., I, 34, pl. 3, f. 7, *Microcœlia*.
1856. Wlk., C. B. Mus., Het., IX, 31, *Microcœlia*.
1864. Grt., Proc. Ent. Soc. Phil., III, 78, pl. 2, f. 2, *Microcœlia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 195, pl. 3, f. 69, *Microcœlia*.
var. *obliterata* Grt.*
1864. Grt., Proc. Ent. Soc. Phil., III, 79, *Microcœlia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 195, pl. 3, f. 70, *Microcœlia*.

HABITAT.—Canada, in June, to Virginia, west to Wisconsin, Missouri, Iowa; Kansas; New York; Massachusetts in June and July; Riley Co., Kansas, in April.

Gueneé's type is in the British Museum, where there is also a specimen of Mr. Grote's species, without a "type" label.

Genus **BRYOPHILA** Tr.

1825. Tr., Schmett. Eur., v, 57.

B. lepidula Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 23, *Jaspidea.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, pl. i, f. 3, *Jaspidea.*
1875. Grt., Stett. Ent. Zeit., xxxvi, 196, *Jaspidea.*
1881. Grt., Bull. Geol. Surv., vi, 570, *Bryophila.*

HABITAT.—Canada in July and August; Maine to New Jersey; Pennsylvania; Minnesota; Missouri; Colorado; New York, June, July, and August; Delaware in July.

The type is in the British Museum.

B. corticosa Gn.

1852. Gn., Spec. Gen., Noct., i, 30, *Bryophila.*
1856. Wlk., C. B. Mus., Het., ix, 27, *Bryophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 8, *Jaspidea.*
1881. Grt., Bull. Geol. Surv., vi, 570, *Bryophila.*

HABITAT.—"Am. Sept."

The type is with M. Oberthür, and the species is as yet unidentified in our collections.

B. viridata Harv.

1876. Harv., Can. Ent., viii, 35, *Jaspidea.*
1882. Grt., New List, 23, *Bryophila.*

HABITAT.—California.

The type is in the Edwards collection.

B. teratophora H. Sch.*

1853. H. Sch., Exot. Schmett., 80, f. 213, *Bryophila.*
1856. Wlk., C. B. Mus., Het., ix, 27, *Bryophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 8, *Jaspidea.*
inscripta Wlk.
1857. Wlk., C. B. Mus., Het., xii, 808, *Erastria.*
1868. G. and R., Trans. Am. Ent. Soc., ii, 78, pr. syn.

HABITAT.—Canada to Texas; Illinois; Iowa, June to August.

Walker's type is in the British Museum, and certainly agrees well with what we have as *teratophora*. The type of the latter I have not seen.

B. nana Hbn.

1818. Hbn., Zutræge, i, 14, ff. 53, 54, *Cryphia.*
1816. Hbn., Verzeichniss, 205, *Cryphia.*
1852. Wlk., C. B. Mus., Het., ix, 26, *Bryophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 8, *Jaspidea.*

HABITAT.—"Georgia in Florida."

This species has not been identified in our collections. It does not look like a *Bryophila* and may not be North American at all. Yet on the other hand the species may turn up again when the Southern States are well collected over.

Genus **CYATHISSA** Grt.

1881. Grt., Bull. Geol. Surv., VI, 576.

C. percara Morr. *

1874. Morr., Proc. Bost. Soc. N. H., XVII, 213, *Bryophila.*
1875. Grt., Proc. Bost. Soc. N. H., XVIII, 414 *Bryophila.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 308, *Jaspidea.*
1881. Grt., Bull. Geol. Surv., VI, 576, *Cyathissa.*

HABITAT.—Florida; Texas, March to May and September; Colorado.

The type is probably at Cambridge; but I have no memorandum of having seen it there.

Genus **CHYTONIX** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 66.

C. palliatricula Gn.*

1852. Gn., Spec. Gen., Noct., I, 26, *Bryophila.*
1856. Wlk., C. B. Mus., Het., IX, 26, *Bryophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 66, *Chytonix.*
1877. Grt., Can. Ent., IX, 196, *Chytonix.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, *Bryophila.*
iaspis Gn.
1852. Gn., Spec. Gen., Noct., I, 209, *Apamea.*
1856. Wlk., C. B. Mus., Het., IX, 250, *Apamea.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 66, *Chytonix.*
1881. Grt., Papilio, I, 49, ? pr. syn.
1882. Grt., New List, 23, pr. syn.

HABITAT.—Canada, May and June, to Virginia; Illinois; Minnesota; New York and Massachusetts in July; North Carolina in August.

Guenée's types are in the British Museum. In *palliatricula* the median space is largely white, else I see no difference. This is a variable feature in the species and is not sexual.

C. sensilis Grt.*

1881. Grt., Papilio, I, 49, *Chytonix.*
1882. Grt., Ill. Essay, 51, pl. I, f. 6, *Chytonix.*

HABITAT.—Massachusetts; New York; New Jersey.

The type is in the British Museum. The white spot in the median streak is a variable character. I have a compared specimen exactly like the type except in that respect. A typical specimen is in Dr. Thaxter's collection.

AGROTIS Auct.

The species classed under the above generic term have been monographically treated by me in *Bulletin No. 38 of the United States National Museum*, Washington, 1890, and in accordance with this revision, the collections in the Museum are arranged. I have carefully compared all the types in the European Museums with the characteristics given for them, and have noted the discrepancies where such existed. It would be waste of space to cite this monograph for every species, and to the end of *Carneades*, the reference is understood even where not made. It is to be noted that I claim generic value for all the divisions proposed by me, and the title *Agrotis* Auct., is simply a convenient heading for this note.

Genus **RHYNCHAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 13.

R. gilvipennis Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., App., 24, *Agrotis*.
1874. Grt., Can. Ent., VI, 71, *Agrotis*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 301, *Agrotis*.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 117 = *chardinyi*.
1876. Grt., Stett. Ent. Zeit., XXXVII, 135 = *chardinyi*.
chardinyi ‡ Morr.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 117, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 14, *Rhynchagrotis*.

HABITAT.—Anticosti; Labrador; Canada; Maine; Vermont in July; Adirondack Mountains, New York, July and August.

I have compared the type of *gilvipennis* in the British Museum with a good series of the Siberian *chardinyi*, and find the two species distinct. The points of difference are numerous, and I have restored Mr. Grote's name. The reference to the synonymy was made by Mr. Morrison, accepted by Mr. Grote, and, without opportunity of comparing the Asiatic form, I followed these authors in my monograph. I have collected a considerable number of specimens of our American form and have examined many others without seeing any that agreed with Boisduval's species. A specimen marked "*gilvipennis* type" by Mr. Morrison, is in the National Museum.

R. rufipectus Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 165, *Agrotis*.
1876. Grt., Ann. Lyc. Nat. Hist., N. Y., XI, 304, *Agrotis*.

HABITAT.—Northern and Eastern States; New York in August, Lewis County in July; Colorado; Oregon; British Columbia; Los Angeles County, California, in October.

I have seen no types. Mr. Morrison states that he received the specimen from Mr. Grote, and the Grote collection contains specimens agreeing with my identification of the species in the U. S. National Museum.

R. brunneicollis Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 524, Pl. 5, f. 5, *Noctua*.
1869. Grt., Trans. Am. Ent. Soc., II, 309, *Agrotis*.

HABITAT.—Canada, Northern, Eastern, and Middle States; west to Iowa, Nebraska, and Colorado; Albany, N. Y., June; Massachusetts in August; Canada, July to September; Vermont in September.

The type is in the collection of the American Entomological Society at Philadelphia, and specimens are in the British Museum, both agreeing with the specimens in the U. S. National Museum.

R. minimalis Grt.*

1879. Grt., No. Am. Ent., i, 45, *Agrotis.*

HABITAT.—Maine, Colorado.

The type is in the British Museum and is like the species so named in the U. S. National Museum.

R. anchocelioides Gn.*

1852. Gn., Sp. Gen., Noct., i, 384, *Cerastis.*
1857. Wlk., C. B. Mus., Het., x, 452, *Cerastis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 26, *Glæa.*
cupida Grt.
1864. Grt., Proc. Ent. Soc. Phil., iii, 525, pl. 5, f. 7, *Noctua.*
1869. Grt., Trans. Am. Ent. Soc., ii, 309, *Agrotis.*
1874. Grt., Can. Ent., vi, 16, *Cerastis.*
1878. Grt., Can. Ent., x, 234, *Agrotis.*
1878. Lintn., Ent. Cont., iv, 124, *Agrotis.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383, *Amathes.*
velata Wlk.
1865. Wlk., C. B. Mus., Het., xxxii, 710, *Graphiphora.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383 = *cupida.*
var. **brunneipennis** Grt.
1875. Grt., Can. Ent., vii, 187, *Agrotis.*
1878. Grt., Can. Ent., x, 234, an var. pr.?
1883. Grt., Proc. Am. Phil. Soc., xxi, 155, *Agrotis.*

HABITAT.—Canada, Northern, Eastern, Middle, and Central States; Iowa; Nebraska; Colorado; New Mexico; Canada in July and August; Massachusetts in August; Illinois, New York, and District of Columbia in September.

Mr. Grote has utterly mistaken Guenée's species. One of the types or specimens from which the description was made is in the British Museum. It is a poor, somewhat rubbed specimen, but it is unquestionably Mr. Grote's *cupida*. The original type of *cupida* is in the collection of the American Entomological Society at Philadelphia and a duplicate "type" is in the British Museum. The type of *Graphiphora velata* Walker is also referable to the same species, as Mr. Butler has stated. The type of *brunneipennis* is with Mr. Thaxter and I have seen it in his collection.

R. placida Grt.*

1876. Grt., Ann. Lyc. Nat. Hist., N. Y., xi, 305, *Agrotis.*
1878. Grt., Can. Ent., x, 235, *Agrotis.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383 = *cupida.*

HABITAT.—Maine; New York, Lewis County, in July; Nevada; Colorado, Glenwood Springs in August and September; Utah; Arizona; New Mexico; Canada.

The type in the British Museum is like the species known to me under this name, and is not the same as *cupida*.

R. variata Grt.*

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 83, Pl. 4, f. 12, *Agrotis*
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 382 = *phyllophora*.
varix Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 83, an var. pr.?
1889. Butler, Trans. Ent. Soc. Lond., 382 = *phyllophora*.
orbis Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 83, *Agrotis*.
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 155 = ? *cupidissima*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 24 = *cupidissima*.

HABITAT.—Colorado; New Mexico; Nevada; Arizona; California; Vancouver; Glenwood Springs, Colorado, in September and October.

Types of each of these names are in the British Museum. Mr. Grote's remarks on his *orbis* thoroughly misled me, and I referred the name to *cupidissima*. As a matter of fact, the type of *orbis* is simply *variata* without the bluish scales, and one of the specimens labeled by Mr. Grote is typical *variata*. The specimens of *variata* in the collections U. S. National Museum are like the type.

R. alternata Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 526, Pl. 5, f. 8, *Noctua*.
1869. Grt., Trans. Am. Ent. Soc., II, 309, *Agrotis*.
1874. Grt., Can. Ent., VI, 15, *Cerastis*.
1874. Grt., Can. Ent., VI, 214, *Agrotis*.
1878. Grt., Can. Ent., X, 235, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond.. 382 = *phyllophora*.

HABITAT.—Canada, July to September; Middle and Northern Atlantic States, west to the Mississippi; Colorado; District of Columbia in June; New York in July and August; Illinois in September.

The type is in the collection of the American Entomological Society, and the species is well and correctly known to collectors generally.

R. belfragei Smith.*

1890. Smith, Bull. U. S. Nat. Mus.. No. 38, 20, *Rhynchagrotis*.

HABITAT.—Texas, March to June.

The type is in collections U. S. National Museum.

R. trigona Smith* n. sp.

cupidissima : Smith.
1890. Smith. Bull. U. S. Nat. Mus., No. 38, 24, *Rhynchagrotis*.

HABITAT.—California; Oregon; Colorado; Arizona; Kansas; British Columbia; Glenwood Springs, Colorado, in August.

Mr. Grote had named *cupidissima* in Mr. Neumoegen's collection, a series of specimens which I assumed were correctly determined. Interpreting Mr. Grote's descriptions by these specimens, I made *orbis* and *lætula* synonyms of *cupidissima* in the monograph. The true *cupidissima* is very different from this species, and neither *orbis* nor *lætula* agree at all with it. A new name for what I have erroneously characterized as Mr. Grote's species is therefore necessary, and I propose *trigona*, as above. The types of this species are the specimens named *cupidissima* by me in the collections U. S. National Museum.

R. bimarginalis Grt.

1883. Grt., Ann. & Mag., N. H., 1883, 53, *Agrotis*.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 54 (*Reprint*).

HABITAT.—New Mexico.

I have seen one of the specimens marked "type" by Mr. Grote, in the Neumoegen collection, and Prof. Snow also has a specimen in his collection.

R. vittifrons Grt.

1864. Grt., Proc. Ent. Soc. Phil., III, 527, pl. 5, f. 8, *Noctua*.
1868. Grt., Trans. Am. Ent. Soc., II, 309, *Agrotis*.

HABITAT.—Colorado, Glenwood Springs in September.

The type is in the collection of the American Entomological Society. The specimen in the British Museum, labeled *vittifrons*, in Mr. Grote's handwriting, is incorrectly determined, and is *formalis*.

R. inelegans Smith.

1890. Smith, Trans. Am. Ent. Soc., XVII, 43, *Agrotis*.

HABITAT.—Sierra Nevada, California.

The type is in the collection of the late Mr. Henry Edwards.

R. mirabilis Grt.

1879. Grt., No. Am. Ent., I, 39, *Agrotis*.

HABITAT.—Colorado; Arizona; New Mexico.

The type in the British Museum agrees with the specimens I have seen in American collections.

R. carissima Harv.

1875. Harv., in Grote, Check List, 25, *Agrotis*.

HABITAT.—California.

The male type is in the British Museum, and had been heretofore unknown to me. It is broad-winged, somewhat like *Orthodes*, and quite unlike any other of the species of this genus. It has no very close allies, and is placed in the series here because the orbicular, so far as it is traceable, is complete.

R. exsertistigma Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 166, *Agrotis.*
1875. Grt., Can. Ent., VII, 26 = *alternata.*
1875. Grt., Can. Ent., VII, 101, ? an sp. dist. *alternata.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 303, an sp. dist.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 79, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., X, 450, *Agrotis.*
observabilis Grt.
1875. Grt., Can. Ent., VII, 144, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., X, 451, ? pr. syn.

HABITAT.—California.

The type of Mr. Morrison's species is now in the Graef collection. Mr. Grote's type in the British Museum is, as I suspected, the same thing, the *observabilis* of the Neumœgen collection being correctly determined. The specimens labeled *exsertistigma* by Mr. Grote, now in the British Museum, are reddish examples of *formalis.*

R. formalis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 61, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., X, 450, *Agrotis.*
var *facula* Grt.*
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 82, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., X, 451, *Agrotis.*
insularis Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 82, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 31 = *formalis* var.
emarginata Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 82, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 33, ? = *formalis* var.

HABITAT.—California, February, April to June, October, November; Vancouver; Portland, Oregon, in May and June; British Columbia.

Types of each of the above species are in the British Museum. A large series of bred specimens in the collections of the National Museum proves that the black-tipped collar is not a specific character in this species, and that the black filling in the cell around the ordinary spots is a variable quantity. The species named *facula* and *formalis* by me agree with the types. *Insularis* is a somewhat more evenly red brown form of *facula*, while *emarginata* is also the same species, but quite uniform in color, the ordinary spots faintly outlined by yellow scales.

R. costata Grt.*

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 80, *Agrotis.*
exsertistigma ‡ Grt.
1875. Grt., Can. Ent., VII, 26, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., X, 451, err. typ.
binominalis Smith.
1887. Smith, Proc. U. S. Nat. Mus., X, 451, *Agrotis.*

HABITAT.—California; Washington; Vancouver.

The type of *costata* in the British Museum is a very poor specimen, without a head. The wings are, however, sufficiently characteristic to make it certain that it is the species I have called *binominalis*, specimens of which are in the U. S. National Museum, the type in the Tepper collection.

R. laetula Grt.*

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 83, *Agrotis*.
1878. Grt., Can. Ent., X, 234=*cupidissima*.
1878. Grt., Bull. Geol. Surv., IV, 173, ? an sp. dist. *cupidissima*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 24 =*cupidissima*.
distracta Smith.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 36, *Rhynchagrotis*.
observabilis ‡ Smith.
1887. Smith, Proc. U. S. Nat. Mus., X, 454, *Agrotis*.

HABITAT.—Washington; Oregon; California.

The type of *lætula* is in the British Museum and is the same as the form named *distracta* by me.

R. discoidalis Grt.

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 82, pl. 4, f. 9, *Agrotis*.

HABITAT.—Nevada; Portland, Oregon, in June.

This species has been correctly placed by me, as appears by the type, in the British Museum.

R. cupidissima Grt.*

1875. Grt., Can. Ent., VII, 101, *Agrotis*.
1878. Grt., Can. Ent., X, 234, *Agrotis*.
1878. Grt., Bull. Geol. Surv., IV, 173, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, *Agrotis*.

HABITAT.—California, July and September.

The type in the British Museum is nothing like the specimens so named by Mr. Grote in Mr. Neumoegen's collection, and which I accepted as correct. The real species I had not seen before. In size it is like *alternata* and there is a distinct blackish costal patch in the s. t. space preceding s. t. line. In the character of the ordinary spots it is nearest to *discoidalis*. I find four specimens of the species in the National Museum, which have been more recently added to the collection.

R. crenulata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 451, *Agrotis*.

HABITAT.—California, June and July; Utah in June; Portland, Oregon, in May.

Types of this species are in the U. S. National Museum, and in Mr. Neumoegen's collection.

R. confusa Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 452, *Agrotis.*
exsertistigma ‡ Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 79, pl. 4, f. 8, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., x, 452, pr. syn.

HABITAT.—Washington.

Types of this species are in the Tepper collection.

Genus **ADELPHAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 38.

A. stellaris Grt.

1880. Grt., Can. Ent., XII, 153, *Agrotis.*

HABITAT.—Nevada; Washington.

Types of this species are in the British Museum and also in Mr. Neumoegen's collection. Mr. Grote usually marked "Type" all the specimens before him when describing a species, and these quite frequently belonged to more than one collection. It thus happens that the "type" may be in several collections as already indicated.

A. indeterminata Wlk.

1865. Wlk., C. B. Mus., Het., XXXIII, 750, *Xylina.*
innotabilis Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., XXVI, 202, *Agrotis.*
1880. Grt., Can. Ent., XII, 154, *Agrotis.*
washingtoniensis Grt.
1881. Grt., Bull. U. S. Geol. Surv., VI, 259, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 40, = *innotabilis.*

HABITAT.—California; Washington; Vancouver.

Types of all these names are in the British Museum, and all are referable to the same species. Mr. Grote can not be blamed for not recognizing Walker's species in its generic disguise; but his name must be restored, nevertheless. The type resembles *innotabilis* rather than *washingtoniensis.*

A. quarta Grt.

1883. Grt., Bull. Geol. Surv., VI, 258, *Agrotis.*

HABITAT.—Sauzalito, California.

The type in the British Museum represents a species I had not before seen. It has nothing in common with *baja* except its ground color and has the structural characters of the present genus, differing obviously from all the species.

A. prasina Fabr.*

1787. Fabr., Mant. Ins., II, 169, *Noctua.*
1852. Gn., Sp. Gen., Noct., II, 75, *Aplecta.*
1857. Wlk., C. B. Mus., Lep. Het., XI, 550, *Eurois.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 163, *Eurois.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 136, *Aplecta.*
1875. Grt., Check List, Noct., *Agrotis.*
herbacea Gn.
1857. Gn., Sp. Gen., Noct., II, 73, *Polyphænis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 12, *Eurois.*

HABITAT.—Canada to Middle States, west to the Mississippi Valley; Iowa; Colorado; Glenwood Springs in August; Europe; Northern States, June to September.

The European synonymy and bibliography are not given. In the British Museum is a specimen marked *Polyphænis herbacea* in what appears to be Guenée's handwriting, and this agrees very well with his description. It is not the type. Guenée appears to have known *prasina* from North America, but a large bright-green specimen such as is sometimes met with might easily have misled him into considering this American form distinct. In the Cambridge Museum I have seen a specimen of *prasina* labeled *herbacea* by Mr. Grote; it is unspread and might easily serve as type of Guenée's description. The type is in collection "Marchand"; but what has become of this I do not know.

A. apposita Grt.*

1878. Grt., Bull. Geol. Surv., IV, 170, *Agrotis*.
1883. Grt., Papilio, III, 78, *Agrotis*.

HABITAT.—California; Vancouver; Colorado.

The type in the British Museum agrees very well with the specimens I have had before me from American collections.

Genus **PLATAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 43.

P. speciosa Hbn.*

1815. Hbn., Lep. Eur., Noct., 491, *Noctua*.
1816. Hbn., Verzeichniss, 218, *Eurois*.
1852. Gn., Sp. Gen., Noct., II, 80, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 553, *Eurois*.
1866. Moeschl., Wien. Ent. Monatschr., VIII, 196, *Agrotis*.
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Agrotis*.
perquirita Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 136, *Polia*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 37, pr. syn.
baileyana Grt.
1879. Grt., No. Am. Ent., I, 92, *Agrotis*.
1880. Grt., Can. Ent., XII, 185, pr. syn.
1880. Grt., Bull. Bkln. Ent. Soc., III, 37, pr. syn.
mixta Wlk.
1856. Wlk., C. B. Mus., Het., IX, 62, *Acronycta*.
1882. Grt., Ill. Essay, 39, pr. syn.
var. **arctica** Zett.
1839. Zett., Ins. Lapl., 339.
1864. Wlk., Stett. Ent. Zeit., 180, pr. var.

HABITAT.—Adirondack Mountains; White Mountains; Vermont; Canada; northern and mountainous Europe.

The bibliography of the variety *arctica* is from Staudinger, and the synonymy is well established. I have seen the Grote, Morrison, and Walker types, and there is no doubt of their identity. The Walker type only is in the British Museum; Mr. Grote's type is in the Dr. Bailey collection at Albany; Mr. Morrison's type is in the Graef collection.

P. pressa Grt.*

1874. Grt., Trans. Am. Ent. Soc., v, 90, *Eurois*.
1875. Grt., Check List, pl. I, f. 7, *Eurois*.
1882. Grt., New List, 26, *Agrotis*.

HABITAT.—Canada in July; Massachusetts in June; New York in July and August. Northern, Eastern, Middle, and Central States.

The type specimen in the British Museum is like the examples representing this species in American collections.

P. condita Gn.*

1852. Gn., Sp. Gen., Noct., II, 78, pl. 8, f. 5, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 556, *Eurois*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 12, *Mamestra*.
1881. Grt., Can. Ent., XIII, 127, (transl. desc.).
1891. Smith, Proc. U. S. Nat. Mus., XIV, 270, ?=*trabalis*.
trabalis Grt.
1877. Grt., Can. Ent., IX, 198, *Agrotis*.

HABITAT.—Massachusetts in June; Canada; Middle, Eastern, and Northern States.

Guenée's type, as I suspected, is like Mr. Grote's species, the type of the latter being with Dr. Thaxter, in whose collection I have seen it.

P. sincera H.-Sch.

1851. H.-Sch., Eur. Schmett., II, 412, *Agrotis*.

HABITAT.—Labrador.

P. imperita Hbn.*

1823. Hbn., Zutræge, ff., 447, 448, *Ogygia*.
1857. Wlk., C. B. Mus., Het., X, 333, *Agrotis*.
1880. Grt., Can. Ent., XII, 118, *Agrotis*.
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Agrotis*.
comparata Moeschl.
1862. Moeschl., Wien. Ent. Monatschr., VI, 131, pl. I, f. 5, *Agrotis*.
1875. Grt., Check List, 6, pr. syn.
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, pr. syn.
saxigena Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 162, *Agrotis*.
1882. Grt., New List, 24, pr. syn.
discitincta Wlk.
1856. Wlk., C. B. Mus., Het., IX, 27, *Bryophila*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 8, *Jaspidia*.
1882. Grt., Ill. Essay, 40, ?*Agrotis*.
1891. Butler, Entomologist, XXIV, 238, pr. syn.

HABITAT.—H. B. Terr.; Labrador; mountains of Northern and Middle States.

Mr. Butler has correctly referred Walker's type. Mr. Moeschler agrees that his species is Hübner's *imperita*, and Mr. Morrison's type in the Graef collection also refers to this same species.

Genus **EUERETAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 47.

E. sigmoides Gn.*

1852. Gn., Sp. Gen., Noct., I, 325, *Noctua*.
1856. Wlk., C. B. Mus., Het., x 400, *Graphiphora*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 9, *Agrotis*.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States, June to August.

The specimens in the U. S. Nat. Mus. collection, and in American collections generally, agree with the type which is in the British Museum.

E. perattenta Grt.*

1874. Grt., Can. Ent., VI, 131, *Agrotis*.
1882. Grt., Ill. Essay, 51, pl. I, f. 7, *Agrotis*.

HABITAT.—Canada; Maine to Texas; west to the Mississippi Valley; New York and Massachusetts in June, July, and August.

A specimen labeled *sigmoides* var., by Gueněe, is like Mr. Grote's type, both in the British Museum.

E. attenta Grt.*

1874. Grt., Can. Ent., VI, 131, *Agrotis*.

HABITAT.—Northern and eastern United States; Canada; Maine in July.

The species is correctly named in American collections. The type is in the British Museum. A specimen marked "type" by Mr. Morrison is in the National Museum.

Genus **ABAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 49.

A. erratica Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 50, *Abagrotis*.

HABITAT.—Sierra Nevada, California, in September.

Types of this species are in the collection U. S. National Museum, and in those of Messrs. Edwards and Neumoegen.

Genus **SEMIOPHORA** Steph.

1829. Steph., Ill. Brit. Ent. Haust., II, 138.

S. elimata Gn.*

1852. Gn., Sp. Gen., Noct., I, 333, *Noctua.*
1856. Wlk., C. B. Mus., Het., X, 400, *Graphiphora.*
1883. Grt., Bull. Geol. Surv., VI, 566, *Agrotis.*
dilucida Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., XXVII, 55, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 170, *Agrotis.*
1879. Butler, Trans. Ent. Soc. Lond., 1889, 385, pr. syn.
var. **badicollis** Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 136, pl. 4, f. 18, *Ammaconia.*
1875. Grt., Can. Ent., VII, pl. I, f. 12, *Agrotis.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., XXVII, 55, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 51, pr. syn.
var. **janualis** Grt.*
1878. Grt., Bull. Geol. Surv., IV, 169, *Agrotis.*
1891. Smith, Bull. U. S. Nat. Mus., No. 38, 51, pr. syn.

HABITAT.—Maine to Georgia; Canada, July and August; New York, June to September; Washington, D. C., in September.

The types of Mr. Grote's species are in the British Museum, and so is also *elimata* Gn. With them are specimens labeled *dilucida* by Mr. Grote, and these are exactly like Guenée's species. Mr. Morrison labeled a number of specimens as "type" and I have seen several of them in collections. They include specimens like Guenée's type and also like Mr. Grote's *janualis*. Mr. Morrison pointed out some of the characters differentiating his species from *elimata;* but these are not essential. As the forms stand in the British Museum, they look like good species; *elimata* rather more gray with the markings well defined and the apices of primaries distinct; *badicollis* much like it in wing form and markings, but still paler and with a contrasting pale collar; *janualis* rounder winged, apices more obtuse, markings almost obsolete. In the large series in the U. S. National Museum the differences seem to vanish; but none of the specimens are like typical *badicollis*, which I never saw previously. Mr. Thaxter also has types of Mr. Grote's species. To differentiate the various forms I have given varietal rank to Mr. Grote's names. Dr. Lintner also has a "type" of *badicollis*.

S. opacifrons Grt.*

1878. Grt., Bull. Geol. Surv., IV, 170, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 97, *Noctua.*

HABITAT.—New York and northward.

The male type in the British Museum has pectinated antennæ and the wing form of *elimata*. The specimens before me when writing the monograph were females only, and I failed to recognize the true relationship of the species.

S. tenebrifera Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 714, *Hadena.*
1891. Smith, Can. Ent., XXIII, 120, *Semiophora.*
catherina Grt.
1874. Grt., Can. Ent., VI, 116, *Matuta.*
1875. Grt., Buff. Bull., I, 124, *Matuta.*
1875. Grt., Can. Ent., VII, pl. I, f. 7, *Matuta.*
1880. Grt., Can. Ent., XII, 187, *Agrotis.*
1891. Smith, Can. Ent., XXIII, 120, pr. syn.
manifestolabes Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 166, *Agrotis.*
1880. Grt., Can. Ent., XII, 187, = *catherina.*

HABITAT.—Northern, Eastern, and Middle States; Canada; May.

The type of Walker's species, from the Bethune collection, is now in the collection of the National Museum. The specimen of *catherina* in the British Museum does not seem to be the type; but is the species Mr. Grote has always so determined. Mr. Morrison's type is now in the Tepper collection, and agrees in all respects with Mr. Grote's specimens, and of course, therefore, as well with Walker's.

Genus **PACHNOBIA** Gn.

1852. Gn., Sp. Gen., Noct., I, 341.

P. monochromatea Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 165, *Agrotis.*

HABITAT.—Massachusetts, in June.

A specimen labeled by Mr. Morrison, and probably a type, is in the collection Boston Society of Natural History. A specimen labeled "type" is in the Neumogen collection.

P. manifesta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 116, *Agrotis.*

HABITAT.—New Jersey; Long Island, New York.

The types are in the Tepper and Neumogen collections.

P. littoralis Pack.*

1868. Pack., Proc. Bost. Soc. N. H., XI, 36, *Agrotis.*
1871. Stgr., Cat. Lep. Eur., 114 = *Pachnobia carnea?*
1891. Smith, Bull. U. S. Nat. Mus., No. 38, 205, *Agrotis.*

HABITAT.—Labrador, Caribou Island.

The type of this species is in the Museum of Comparative Zoology at Cambridge. I failed to find the type at Salem, in the Peabody Museum; but matters were there in great confusion. Since that time the insects have been transferred to Cambridge, and what remains of the type is found there. Staudinger's suggestion that it may be a form of *carnea* is contradicted by the antennal characters; but the reference to *Pachnobia* is correct. It looks like *pectinata* Grt., with the maculation scarcely traceable, and there is no difficulty in recognizing the species. A specimen marked "type" by Mr. Morrison is in the National Museum.

P. pectinata Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 207, *Pseudorthosia.*
1876. Grt., Can. Ent., viii, 17, *Choephora.*
1876. Grt., Bull. Buff. Soc. Nat. Sci., iii, 86, *Choephora.*
1882. Grt., New List, 31, *Pseudorthosia.*
ferruginoides Smith.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 56, *Pachnobia.*

HABITAT.—Colorado, Hall Valley, August; Montana; Black Hills.

I was quite surprised to find that Mr. Grote's type in the British Museum was my species. The specimens originally labeled by me came from Dr. Hulst's collection. Afterwards I found in the Riley collection in the National Museum a specimen labeled by Mr. Morrison "*Pseudorthisia pectinata* type." I therefore did not describe the species in 1887 with the other species named by me. Subsequently I compared the specimen with the original description and concluded that it could not well be intended to apply to this species and renamed it. The National Museum specimen is labeled by me as type, and a "type" is also in the Tepper collection.

[A number of Colorado specimens seen recently make it certain that this is but a form of *littoralis* Pack. *Pectinata* may stand for the variety with distinct median lines.]

P. haesitans Wlk.

1856. Wlk., C. B. Mus., Het., x, 329, *Agrotis.*

HABITAT.—Rocky Mountains.

The type is a well-preserved male, the antennæ distinctly pectinated, the other characters as in *Pachnobia*, save that it has the aberrant, dull, ash-gray color of my *cinerascens*. It is not unlike this latter save in antennal characters. The median lines are single, t. p. line crenate, cell blackish between the ordinary spots.

P. salicarum Wlk.*

1857. Wlk., C. B. Mus. Het., xi, 717, *Hydrœcia.*
1882. Grt., Ill. Essay, 42, *Pachnobia.*
orilliana Grt.
1875. Grt., Can. Ent., vii, 154, *Pachnobia.*
1875. Grt., Can. Ent., vii, 227, pl. i, f. 8 = *claviformis.*
1882. Grt., Ill. Essay, 42, pr. syn.
claviformis Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 162, *Agrotis.*
1875. Morr., Proc. Bost. Soc. N. H., xviii, 115, *Agrotis.*
1880. Grt., Bull. Bklu. Ent. Soc., iii, 36 = *orilliana.*
1882. Grt., Ill. Essay, 42 = *salicarum.*

HABITAT.—Massachusetts; Maine; White Mountains and Northward; Canada; Hudson Bay Terr., April and May.

Walker's type is in the British Museum; but I could not find any specimens labeled by Mr. Grote. Mr. Morrison's type is in the Tepper collection, Agricultural College, Michigan.

P. okakensis Pack.

1867. Pack., Proc. Bost. Soc. N. H., XI, 38, *Agrotis*.
1875. Morr., Psyche, I, 42, *Agrotis*.

Habitat.—Labrador; Mount Washington, July 10.

The type is in the Museum of Comparative Zoölogy at Cambridge.

P. fishii Grt.*

1878. Grt., Bull. Geol. Surv., IV., 175, *Agrotis*.

Habitat.—Oldtown, Maine.

The type is in the British Museum. I have correctly labeled a specimen in the National Museum with this name.

P. elevata Smith.

1891. Smith, Trans Am. Ent. Soc., XVIII, 104, *Pachnobia*.

Habitat.—Colorado.

The type is in Mr. Neumoegen's collection.

P. carnea Thunb.*

1788. Thunb., Mus. Nat. Ac. Ups., Diss., IV, p. 56, 72, f. 1.
1816. Hbn., Verzeichniss, 222, *Diarsia*.
1852. Gn., Sp. Gen., Noct., I, 342, *Pachnobia*.
1856. Wlk., C. B. Mus., Het., X, 415, *Pachnobia*.
1860. Moeschl., Wien. Ent. Monatschr., IV, 163, *Pachnobia*.
1866. Moeschl., Wien. Ent. Monatschr., VIII, 197, *Pachnobia*.
1868. Pack., Proc. Bost. Soc. N. H., XI, 39, *Agrotis*.
1875. Grt., Psyche, I, 77, 100, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Pachnobia*.
ab. **cinerea** Stgr.
1861. Stgr., Stett. Ent. Zeit.. XXII, 369, *Pachnobia*.

Habitat.—Labrador; Lapland; Circumpolar; Mount Washington, N. H.

For the European synonymy and bibliography, Staudinger should be consulted. I have not seen Thunberg's original work. In the British Museum collections Mr. Butler has confused three species under this name.

P. cinerascens Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 103, *Pachnobia*.

Habitat.—Alameda County, California, September and October.

The types are in the collections of the U. S. National Museum.

P. wockei Moeschl.*

1862. Moeschl., Wien. Ent. Monatschr., VI, 130, pl. I, f. 1, 2, *Agrotis*.
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Agrotis*.
scropulana, Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 165, *Agrotis*.
1875. Morr., Psyche. I, 42, *Agrotis*.
1875. Grt., Psyche, I, 77=*carnea*.

1875. Morr., Psyche, I, 85, an sp. dist.
1875. Grt., Psyche, I, 100=*carnea*.
1885. Smith, Ent. Amer., I, 14, pr. syn.
1885. Smith, Stett. Ent. Zeit., XLVI, 223, pr. syn.

HABITAT.—Mount Washington, N. H.; Labrador.

Mr. Moeschler's type has been in my hands and has been compared by me with Morrison's type from the Graef collection. The species is in the British Museum, mixed with *carnea*.

Genus **SETAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 59.

S. planifrons Smith.

1890. Smith, Trans. Am. Ent. Soc., XVII, 42, *Agrotis*.

HABITAT.—Northwest British Columbia.

The type is in Mr. Neumoegen's collection.

S. congrua Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 43, *Agrotis*.

HABITAT.—Oregon.

The type is in the National Museum collection.

S. vernilis Grt.*

1879. Grt., Can. Ent., XI, 57, *Agrotis*.
1879. Grt., No. Am. Ent., I, 38, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 42, *Adelphagrotis*.

HABITAT.—Colorado, Glenwood Springs in August and September; Nevada; Sierra Nevada, California.

S. infimatis Grt.

1880. Grt., No. Am. Ent., I, 93, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 42, *Adelphagrotis*.

HABITAT.—California; Washington.

The types of both *vernilis* and *infimatis* are in the British Museum, and both are males. The specimens I had theretofore seen were all females, and my guess as to the character of the male antenna proved erroneous. Removed to *Setagrotis*, the characters pointed out by me still hold to separate the species. From the two forms described by me they are entirely distinct.

Genus **AGROTIS** Ochs.

1816. Ochs., Schmett. Eur., IV, 66.

A. badinodis Grt.*

1874. Grt., Can. Ent., VI, 13, *Agrotis*.

HABITAT.—Maryland; New York; Canada; Middle, Eastern, and Northern United States in August and September; Texas in November.

The type is in Dr. Lintner's collection.

A. violaris G. & R.

1868. G. & R., Trans. Am. Ent. Soc., I, 353, pl. 7, f. 59, *Agrotis*.

HABITAT.—Pennsylvania; Middle States.

The specimen in the British Museum is not the type. The type is in the Museum of Comparative Zoölogy at Cambridge, and is marked New York, Mrs. Bridgham. There is also a specimen in the collection of the American Entomological Society at Philadelphia, labeled by Mr. Grote; but not marked type. It is, however, likely that this specimen is the original of the figure illustrating the description.

A. aurulenta Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 215, *Agrotis*.

HABITAT.—Colorado, foot-hills near Denver, Platte Cañon, 6,500 feet; Omaha, Nebraska, in June; Arizona.

The types are in the National Museum collection.

A. ypsilon Rott.*

1776. Rott., Naturf, XLI, 141, *Noctua*.
1816. Hüb., Verzeichniss, 225, *Exarnis*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 135, *Agrotis*.
1883. Saund., Fruit Insects, 327, f. 338, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 380, *Peridroma*.
suffusa S. V.
1776. S. V., p. 80, *nomen Catalogi*.
1852. Gn., Sp. Gen., Noct., I, 268, *Agrotis*,
1857. Wlk., C. B. Mus., Het., X, 309, *Agrotis*.
telifera Harr.
1841. Harr., Rept. Ins. Mass., *Agrotis*.
1842. Harr., Inj. Ins., 323, *Agrotis*.
1864. Grt., Proc. Ent. Soc. Phil., III, 95, pr. syn.
1868. Riley, Rept. Ins. Mo., I, 28, 80, pl. I, f. 8–10, *Agrotis*.
1881. Riley, Index and Suppl. to Mo. Repts., 55, pr. syn.
idonea Cram.
1782. Cram., Exot., III, 150, 275, f. H, *Phalæna*.
1852. Gn., Sp. Gen., Noct., I, 269, pr. var.
1856. Wlk., C. B. Mus., Het., 309, pr. syn.

HABITAT.—United States and Canada, June to October; Europe.

This common and well-known species has a large European bibliography, and has been frequently described in all its stages in economic publications. What has been above given will serve to authenticate the synonymy so far as necessary here.

A. geniculata G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 349, pl. 7, f. 54, *Agrotis*.

HABITAT.—Northern, Eastern, and Middle States; Canada; Massachusetts in August; District of Columbia in September.

The specimen in the British Museum agrees with the determination usual in American collections, but it is not the type. The type is in the collection of the American Entomological Society, labeled by Mr. Grote, but not marked "type." It seems to be the original of the figure cited above, and in view of Mr. Grote's statement, quoted in the preface hereto, must be considered "type."

A. ingeniculata Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 216, *Agrotis*.

HABITAT.—Colorado.

The type is with Mr. J. Angelman, Newark. An exact duplicate is in the Coll. U. S. National Museum.

A. bollii Grt.

1883. Grt., Bull. Geol. Surv., VI, 160, *Agrotis*.
hilaris ‖ Grt.
1880. Grt., Can. Ent., XII, 153, *Agrotis*.

HABITAT.—Texas.

The type is in the British Museum, and is a very distinct species, which I had not before seen.

A. dapsilis Grt.

1883. Grt., Bull. Geol. Surv., VI, 582, *Agrotis*.

HABITAT.—Florida.

The type is with Dr. Thaxter, in whose collection I have seen it. It is altogether impossible to locate it generically because of its imperfect condition.

A. hero Morr.

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 238, *Agrotis*.
1880. Grt., Bull. Geol. Surv., VI, 160, *Agrotis*.

HABITAT.—Massachusetts.

I have never seen this species and do not know where the type can be found. It is not likely that this name refers to a form distinct from any other here given; but I can not at present place it.

A. nanalis Grt.

1881. Grt., Can. Ent., XIII, 131, *Agrotis*.

HABITAT.—Nevada.

The type in the British Museum is evidently from Mr. Tepper. It is an imperfect female, with smooth front, no fore legs, and broad, frail wings. It is obscurely fuscous brown or black, ordinary spots fused as in *hollemanni*, but faint. I never before saw it, and without a male can not give it a definite place.

A. tenuicola Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 163, *Agrotis*.

HABITAT.—New York.

It is more than likely that this will turn out a form of *Noctua conflua*; but I have nothing answering nearly enough to it to make sure. I am utterly in the dark as to the location of the type.

In both the Graef and Neumoegen collections there are specimens marked *tenuescens* Morr., type. These can not well have served as the types for the description of *tenuicola*, and are related to *simplaria* and *incivis* rather than *conflua*. I have adopted Mr. Morrison's name for the specimens so labeled.

Genus **PERIDROMA** Hbn.

1816. Hbn., Verzeichniss, 227.

P. occulta Linn.*

1767. Linn., Syst. Nat., IV, 514, *Noctua*.
1816. Hbn., Verzeichniss, 218, *Eurois*.
1852. Gn., Sp. Gen., Noct., II, 76, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 551, *Eurois*.
1874. Grt., Can. Ent., VI, 13, 70, *Eurois*.
1876. Speyer, Stett. Ent. Zeit., XXXVI, 204, *Aplecta*.
docilis Grt.
1883. Grt., Bull. Geol. Surv., VI., 259, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 143, = *perexcellens*.

HABITAT.—Northern and Eastern States; Canada; Colorado, Glenwood Springs in October; British Columbia; Massachusetts in June; Canada, New York and Illinois in August.

In the British Museum is a specimen marked *docilis* Grt. type, which is without any doubt a form of *occulta*. It is from Snow, Colorado, No. 894, and is entirely different from the specimen marked *docilis* in the Edwards collection. From the description and Mr. Grote's remarks on the species, I am persuaded that a form of *perexcellens* was really what Mr. Grote intended to describe and that Mr. Edwards's specimen represents the form to which the name should have been attached. The small specimen of *occulta*, similar in color, probably escaped notice among the other specimens and received the type label. It makes no practical difference which specimen is accepted as type, since in either case the name goes into the synonymy.

P. præfixa Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 117, *Agrotis*.

HABITAT.—Rocky Mountains.

The type is in the collection of Mr. Julius Meyer.

P. astricta Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 135, *Eurois*.

HABITAT.—New York in July; New Hampshire and Northern States; Canada; Colorado.

The type is in the National Museum.

P. grandipennis Grt.

1883. Grt., Ann. and Mag. N. H., 1883, 54, *Agrotis.*
1884. Grt., Trans. Kans. Ac. Sci., viii, 54 (Reprint).

HABITAT.—New Mexico.

Types are in the Neumoegen and Snow collections.

P. saucia Hbn.*

1816. Hbn., Samml. Eur. Schmett., Noct., 378, *Noctua.*
1816. Hbn., Verzeichniss, 227, *Peridroma.*
1825. Tr., Schmett., Eur., v, 149, *Agrotis.*
1852. Gn., Sp. Gen., Noct., i, 271, *Agrotis.*
1856. Wlk., C. B. Mus., Het., x, 311, *Agrotis.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 135, *Agrotis.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 134, *Agrotis.*
1883. Saund., Fruit Insects, 106, ff. 100—103, *Agrotis.*
inermis Harr.
1841. Harr., Rept. Ins. Mass., *Agrotis.*
1842. Harr., Inj. Ins., 323, *Agrotis.*
1869. Riley, 1st Rept. Ins. Mo., 72, pl. 1, ff. 1–4, *Agrotis.*
1873. Pack., Our Common Insects, 199, f. 240, *Agrotis.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 135, pr. syn.
1876. Riley, 8th Rept. Ins. Mo., 37, ff. 24, 25, *Agrotis.*
1881. Riley, Index and Suppl. to Mo. Repts., 55, pr. syn.
ortonii Pack.
1869. Pack., 1st Rept. Peab. Ac. Sci., 63, *Agrotis.*
1874. Morr., Proc. Bost. Soc. N. H., xvii, 210, pr. syn.
var. **margaritosa** Haw.
1810. Haw., Lepid. Britt., 157, *Noctua.*
1852. Gn., Sp. Gen., Noct., i, 271, pr. syn.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 134, var. pr.

HABITAT.—North and South America; Europe; Asia. Canada, July and August; New York and Illinois, August and September; District of Columbia, September and October; California in April and May.

This species has a large economic bibliography. In the British Museum Mr. Butler has placed a lightly-marked specimen of *turris* Grt., with typical *saucia* and has published them as identical. They differ structurally. A specimen labeled *inermis* is in the Harris collection at Boston.

P. rudens Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., ii, 271, *Agrotis.*

HABITAT.—Texas in December and May.

P. pellucidalis Grt.*

1883. Grt., Bull. Geol. Surv., vi, 567, *Agrotis.*
rudens Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 5, *Agrotis.*

HABITAT.—Texas in December and May; Colorado, Manitou in June.

The types of both the above species are in the British Museum, and are as identified in American collections.

P. incivis Gn.*

1852. Gn., Sp. Gen., Noct., I, 274, *Agrotis.*
1856. Wlk., C. B. Mus., Het., X, 330, *Agrotis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 303, *Agrotis.*
1874. Morr., Proc. Bost. Soc. N. H., XVII, 164, *Agrotis.*
1880. French, Can. Ent., XII, 14 (larva sub nom. *lubricans*).
1882. French, Can. Ent., XIV, 240, *Agrotis.*
alabamæ Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 159, *Anicla.*
1875. Grt., Can. Ent., VII, 102, pr. syn.

HABITAT.—Massachusetts in September; District of Columbia to Florida; Mississippi; Illinois; Texas, November, December, and June; California.

The types of both *incivis* and *alabamæ* are in the British Museum, and both names refer to the species known as *incivis* in our collections. I have not given the bibliography relating to *infecta* Ochs., and *præcox*‡ Hbn., because I consider the synonymy doubtful. It is given in the Bull. U. S. Nat. Mus., No. 38, p. 72.

P. tenuescens Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 73, *Peridroma.*

HABITAT.—Nebraska.

The types are in the Graef and Neumoegen collections, labeled by Mr. Morrison as types of the name, but not described.

P. simplaria Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 164, *Agrotis simplicius.*
1875. Morr., Proc. Bost. Soc. N. H., XVII, 210, *Agrotis simplaria.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 5, *Agrotis simplicia.*
1880. Grt., Bull. Geol. Surv., VI, 108, *Agrotis.*

HABITAT.—Texas, March, April, October, and November.

The type, sub nom. *simplicius* is in the Museum of Comparative Zoölogy at Cambridge.

P. digna Morr.*

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 115, *Agrotis.*
nigrovittata Grt.
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 77, *Agrotis.*

HABITAT.—Texas, May and August.

Mr. Grote's type is in the British Museum; that of Mr. Morrison is in the Tepper collection. The two are specifically identical.

Genus **NOCTUA** Linn.

1758. Linn., Systema Naturæ.

N. baja Fabr.*

1787. Fabr., Mant. Ins., II, 175, *Noctua.*
1791. Oliv., Enc. Meth., VIII, 345, *Noctua.*
1793. Fabr., Ent. Syst., III, 2, 109, *Noctua.*
1793. Gmel., ed. Linn. Syst. Nat., 2579, *Noctua.*

1816. Hbn., Verzeichniss, 222, *Amathes.*
1834. Hbn., Schmett. Eur., Noct., IV, pl. 25, f. 119, *Noctua.*
1852. Gn., Sp. Gen., Noct., I, 335, *Noctua.*
1856. Wlk., C. B. Mus., Het., X, 396, *Graphiphora.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 122, *Agrotis.*
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 80, *Agrotis.*

HABITAT.—United States and Europe; Northern States, July, August, and September.

N. normaniana Grt.*

1874. Grt., Trans. Am. Ent. Soc., V, 89, *Agrotis.*
triangulum‡ Auct.
1852. Gn., Sp. Gen., Noct., I, 331, *Noctua.*
1856. Wlk., C. B. Mus., Het., X, 390, *Graphiphora.*
1868. Beth., Can. Ent., I, 86, *Graphiphora.*
1874. Grt., Trans. Am. Ent. Soc., V, 89, pr. syn.
obtusa Speyer.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 124, 126, *Agrotis*, ? pr. syn.
1882. Grt., New List, 24, pr. syn.

HABITAT.—Northern, Middle, and Eastern States; Canada, July to September; New York, Illinois, Massachusetts, August and September; District of Columbia in September.

Mr. Grote's type is in the British Museum, and is correctly identified in American collections.

N. bicarnea Gn.*

1852. Gn., Sp. Gen., Noct., I, 329, *Noctua.*
1856. Wlk., C. B. Mus., Het., X, 400, *Graphiphora.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383, *Amathes.*
plagiata Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 664, *Mamestra.*
1882. Grt., Ill. Essay, 44, pr. syn.
1889. Butl., Trans. Ent. Soc. Lond., 1889, 383, pr. syn.

HABITAT.—United States east of the Rocky Mountains; Colorado; British Columbia; Northern States, July to September.

Mr. Grote's reference of *plagiata* to *bicarnea* is correct. Both the types are in the British Museum.

N. treatii Grt.*

1875. Grt., Can. Ent., VII, 186, *Agrotis.*

HABITAT.—Massachusetts.

The specimen in the National Museum is like Mr. Grote's type in the British Museum, save that it is a much larger and finer example.

N. conchis Grt.

1879. Grt., No. Am. Ent., I, 43, *Agrotis.*
1880. Grt., Trans. Kans. Ac. Sci., VII, 66, *Agrotis.*
1882. Grt., Ill. Essay, 51, pl. I, f. 8, *Agrotis.*

HABITAT.—Colorado; New Mexico.

The type is in the British Museum, and is well represented by the figure in the Illustrated Essay.

N. c-nigrum Linn.*

1758. Linn., Syst. Nat., ed. x, 516, *Noctua*.
1767. Linn., Syst. Nat., ed. xii, 852, *Noctua*.
1816. Hbn., Verzeichniss, 223, *Megasema*.
1852. Gn., Sp. Gen., Noct., i, 328, *Noctua*.
1856. Wlk., C. B. Mus., Het., x, 389, *Graphiphora*.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 126, *Agrotis*.
1883. Edw., Papilio, iii, 133, *Agrotis*.

HABITAT.—North America and Europe; New York, June to October; Illinois, August and September.

The economic bibliography is large, and the species is frequently referred to in publications in such manner only as not to merit citation here.

N. hospitalis Grt.

1882. Grt., Can. Ent., xiv, 184, *Agrotis*.
1886. Grt., Can. Ent., xviii, 220=*perconflua*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 83, an sp. dist.

HABITAT.—Northern New York.

The type is in the collection of the late W. W. Hill, Albany, N. Y.

N. jucunda Wlk.*

1856. Wlk., C. B. Mus., Het., x, 399, *Graphiphora*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 382, *Amathes*.
conflua ‡ Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., App., 25, *Agrotis*.
1874. Grt., Can. Ent., vi, 71, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 382, pr. syn
perconflua Grt.
1876. Grt., Ann. Lyc. Nat. Hist. N. Y., xi, 304, *Agrotis*.
var. **esurialis** Grt.
1881. Grt., Can. Ent., xiii, 131, *Agrotis*.

HABITAT.—Northern and Eastern States; Canada and northward; Washington, August.

The type of *perconflua* is like the type of *jucunda*, and Mr. Grote's name sinks. *Perconflua* is undoubtedly the species Mr. Grote has written of as *conflua;* but the specimen in the British Museum, labeled *conflua* by Mr. Grote, is *rubifera*. The type of *esurialis*, also in the Museum, is without doubt the same species, differing only in that the orbicular is imperfectly closed superiorly, and the cell between the ordinary spots more prominent than usual. The specimen is from Washington, and is perhaps a good geographical race.

N. phyllophora Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 61. *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 382, *Amathes*.
1891. Butler, Entomologist, xxiv, 238=*subporphyrea*.
dahlii ‡ Beth.
1868. Beth., Can. Ent., i, 86, *Graphiphora*.
eriensis Grt.
1878. Grt., Bull. Geol. Surv., iv, 172, *Agrotis*.

HABITAT.—Northern, Middle, and Eastern States; Canada in July; Massachusetts and New York, June and July.

Mr. Butler has succeeded in mixing up several distinct species under this name. *Subporphyrea*, *phyllophora*, *alternata*, and *variata* are all good species. On the other hand the type of *eriensis* is simply a somewhat suffused form, in which the basal and costal spaces are mottled with yellow.

N. rubifera Grt.*

1875. Grt., Can. Ent., VIII, 207, 227, pl. i, f. 14, *Agrotis*.
rubi ‡ Grt.
1875. Grt., Can. Ent., VII, 207, *Agrotis*.
dahlii var. A, Gn.
1852. Gn., Sp. Gen., Noct., I, 332, *Noctua*.
1856. Wlk., C. B. Mus., Het., X, 393, *Graphiphora*.

HABITAT.—Northern and Eastern States; Canada, in July; New York, in August.

The type is in the British Museum, and is the species I have described in the monograph under this name.

N. oblata Morr.*

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 116, *Agrotis*.
hilliana Harv.
1878. Harv., Can. Ent., X, 55, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 86, pr. syn.

HABITAT.—Anticosti; New York; Nevada; Sierra Nevada, California.

A specimen of *hilliana* marked "type" is in the British Museum, and another so marked is in Mr. Hill's collection. They agree with each other and also agree with specimens of the same species marked "*oblata* type," by Mr. Morrison. A number of good specimens are in the National Museum, agreeing with Dr. Harvey's types. The original type of *oblata* is in Dr. Strecker's collection.

N. rosaria Grt.*

1878. Grt., Bull. Geol. Surv., IV, 172, *Agrotis*.

HABITAT.—California; British Columbia; Colorado, August.

The type is in the British Museum. The male is very like the eastern *rubifera* ♂, and specimens of this sex resemble each other much more than do the females.

N. rava H. Sch.*

1850. H. Sch., Schmett. Eur., VI, 59, Suppl. f., *Agrotis*.
1860. Moeschl., Wien. Ent. Monatschr., IV, 367, *Agrotis*.
dissona ‡ Pack.
1867. Pack., Proc. Bost. Soc. N. H., XI, 38, *Agrotis*.
umbrata Pack.
1867. Pack., Proc. Bost. Soc. N. H., XI, 37, *Agrotis*.

HABITAT.—Labrador; Nova Scotia.

Dr. Packard's type is in the Museum of Comparative Zoölogy, Cambridge.

N. fennica Tausch.*

1837. Eversm., Bull. Soc. Imp. Mosc., I, t. 13, 4, *Noctua*.
1852. Gn., Sp. Gen., Noct., I, 270, *Agrotis*.
1857. Wlk., C. B. Mus., Het., X, 311, *Agrotis*.
1874. Grt., Can. Ent., VI, 155, *Agrotis*.
intractata Wlk.
1857. Wlk., C. B. Mus., Het., XI, 884, *Hadena*.

HABITAT.—Northern New York, northward to Alaska; Canada in August; Massachusetts in September.

Mr. Walker's type in the British Museum is a very fair specimen and readily recognizable as *fennica*.

N. plecta Linn.*

1761. Linn., Fn. Suec., 321, *Noctua*.
1767. Linn., Syst. Nat., ed. XII, 2, 851, *Noctua*.
1816. Hbn., Verzeichniss, 223, *Ochropleura*.
1852. Gn., Sp. Gen., Het., I, 326, *Noctua*.
1856. Wlk., C. B. Mus., Het., X, 406, *Ochropleura*.
1862. Grt., Proc. Ent. Soc. Phil., I, 218, *Chersotis*.
1874. Morr., Psyche, I, 22, *Agrotis*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 131, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 384, *Ochropleura*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 89, *Noctua*.

HABITAT.—Canada to Texas; Eastern United States; Europe; Canada, May to August; New York, June, July, to September.

None of the European synonymy is given, and the bibliography relating to *vicaria* Wlk., is also omitted as unnecessary.

N. collaris G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 348, pl. 7, f. 53, *Agrotis*.

HABITAT.—New York, northward to Canada; New York in July; Massachusetts in August; New Hampshire in September.

A specimen labeled by Mr. Grote, and probably the type, though not so marked, is in the collection of the American Entomological Society.

N. juncta Grt.

1878. Grt., Bull. Geol. Surv., IV, 171, *Agrotis*.

HABITAT.—Nova Scotia.

The male type is in the British Museum. It has all the structural characters of the present section, and is most nearly like *collaris*, yet distinct from anything I had before seen.

N. haruspica Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 212, *Agrotis*.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 424, *Agrotis*.
1876. Grt., Bull. Geol. Surv., II, 214, *Agrotis*.
1885. Smith, Ent. Amer., I, 13, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 382, *Graphiphora*.
unimacula‖ Morr.

1874. Morr., Proc. Bost. Soc. N. H., xvii, 166, *Agrotis*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 212, n. b. l.
grandis Speyer.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 122; var. *augur*.
1876. Speyer, Stett. Ent. Zeit., xxxvii, 201; var. *augur*.
1884. Moeschl., Verh., k. k. Zool-Bot. Ges., 273; var. *augur*.
1885. Smith, Ent. Amer., i, 13, an sp. dist. *augur*.
augur‡ Gn.
1852. Gn., Sp. Gen., Noct., i, 325, *Noctua*.
1856. Wlk., C. B. Mus., Het., x, 387, *Graphiphora*.

Habitat.—Northern and Eastern United States; Colorado; Utah; Montana; Canada, in July; New York, July and August.

The type is in the British Museum, and is like specimens with the same name in American collections.

N. sierræ Harv.*

1876. Harv., Can. Ent., viii, 37, *Agrotis*.

Habitat.—Sierra Nevada, California; Colorado, August.

A specimen in the British Museum is marked "type," in Mr. Grote's handwriting. The species is in no doubt, and is well identified in the National Museum.

N. clemens Smith.*

1890. Smith, Trans. Am. Ent. Soc., xvii, 44, *Agrotis*.

Habitat.—California, Placer County in June.

Types of this species are in the National Museum and in Mr. Neumoegen's collection.

N. clandestina Harr.*

1862. Harris, Inj. Ins. (Flint ed.), 448, life hist., *Noctua*.
1869. Grt., Trans. Am. Ent. Soc., ii, 309, *Agrotis*.
1869. Saund., Can. Ent., ii, 35, *Noctua*.
1869. Riley, 1st Rept. Ins. Mo., 79, pl. i, f. 13, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 143, *Noctua*.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 131, 347, *Agrotis*.
1881. Riley, Index and Supplt. to Mo. Repts., 55, *Agrotis*.
1883. Saund., Fruit Insects, 108, f. 106, 107, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 381, = *Spælotis ravida*.
unicolor Wlk.
1856. Wlk., C. B. Mus., Het., ix, 233, *Mamestra*.
1869. G. & R., Trans. Am. Ent. Soc., ii, 77, pr. syn.
1877. Grt., Can. Ent., ix, 28, pr. syn.
nigriceps Wlk.
1865. Wlk., C. B. Mus., Het., xxxii, 659, *Mamestra*.
1891. Smith, Can. Ent., xxiii, 119, pr. syn.

Habitat.—United States, except Southern States and Pacific coast; Canada and Northern States in July and August.

Harris's type is in the Boston Society of Natural History, the type of *nigriceps* is in the National Museum from Dr. Bethune, the type of *unicolor* is in the British Museum. I have seen them all.

N. havilæ Grt.

1880. Grt., Bull. Geol. Surv., VI, 157, *clandestina* var.
1881. Grt., Papilio, I, 76, an sp. dist.
1881. Butler, Papilio, I, 169, an sp. dist.

HABITAT.—Southern California in June; Colorado.

The type is in the British Museum, and is like the National Museum material in this species.

N. subporphyrea Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1658, *Mythimna*.
1882. Grt., Ill. Essay, 41, ? *Agrotis*.
1891. Butler, Entomologist, XXIV, 238=*Agr. phyllophora*.

HABITAT.—Georgia.

The female type in the British Museum represents a species I had not before seen. It is imperfect, lacking the abdomen; but the front is smooth; the foretibiæ are spinose and the palpi are as in *clandestina*. It looks like a red *alternata* with all the maculation washed out, leaving only the slightly paler median lines. Mr. Butler has placed *phyllophora*, *alternata*, *varix*, and *variata* under this name as representing one species, and in the Entomologist, XXIV, 238, says: "Walker's type is slightly faded and without abdomen, but is certainly typical *A. phyllophora*, which it will probably supersede." This was published while I was in England, but I did not see it until after my return, else I would have made more detailed comparisons. The specimen did not even suggest *phyllophora* to me, and it can not be that species; first, because it has none of its characteristic markings, and second, because it is from Georgia, while *phyllophora* is decidedly a Northern insect, and has never, in my experience, been taken as far South as Washington, D. C., where there have been good collectors at work. I believe the specimen to be one of those taken by Abbot, and a species which has not been since found. Among the unpublished drawings by Abbot in the British Museum are a number of Noctuidæ that I never saw and that are certainly undescribed. Such species as *Varina ornata* Neum., described only a year or two ago, were figured and the habits noted by Abbot, and the specimens were afterward named by Walker. No one has since collected Lepidoptera systematically on Abbot's old ground, and when that is once done, I have no doubt that *subporphyrea* Wlk. will be rediscovered.

N. piscipellis Grt.

1878. Grt., Can. Ent., X, 233, *Agrotis*.

HABITAT.—Colorado; Nevada; Arizona.

The type is in the British Museum, and is like the specimens so named by me.

N. atrifrons Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 97, *Agrotis*.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 47, *Agrotis*.

HABITAT.—Colorado; Arizona; New Mexico.

The type is in the British Museum.

N. tepperi Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 452, *Agrotis*.

HABITAT.—Montana.

The type is in the Tepper collection.

N. lubricans Gn.*

1852. Gn., Sp. Gen., Noct., I, 323, *Noctua*.
1856. Wlk., C. B. Mus., Het., x, 398, *Graphiphora*.
1864. Grt., Proc. Ent. Soc. Phil., III, 525, =*clandestina*.
1869. Grt., Trans. Am. Ent. Soc., II, 309; an sp. dist.
associans Wlk.
1858. Wlk., C. B. Mus., Het., xv, 1683, *Mamestra*.
illapsa Wlk.
1857. Wlk., C. B. Mus., Het., XI, 744, *Graphiphora*.
var. **beata** Grt.*
1883. Grt., Ann. and Mag. N. H., 1883, 54, *Agrotis*.
1883. Grt., Trans. Kans. Acad. Sci., VIII, 54, *Agrotis*.
1885. Smith, Can. Ent., XVII, 6, pr. syn.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 96, pr. var.

HABITAT.—United States generally; Canada; Massachusetts, June to August; Texas, March, July; District of Columbia, May and September; New Mexico in August; Colorado, August.

The types of all save *beata* are in the British Museum. The type of *beata* was given me by Mr. Grote himself, years ago, and is now in the National Museum. All the names refer to the same species.

N. vocalis Grt.

1879. Grt., Can. Ent., XI, 56, *Agrotis*.
1882. Grt., Ill. Essay, 54, pl. II, f. 15, *Agrotis*.
invenusta Grt.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 48, *Agrotis*.

HABITAT.—Colorado, August; Nevada; New Mexico.

The type of *vocalis* is in the British Museum; that of *invenusta* has been in my hands from an American collection; but I have no note as to its present location.

N. pallidicollis Grt.

1880. Grt., Bull. Geol. Surv., VI, 154, *Agrotis*.
cinereocollis ‖ Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 79, pl. 4, f. 6, *Agrotis*.
1880. Grt., Bull. Geol. Surv., VI, 154, n. b. l.

HABITAT.—California.

The type is in the Henry Edwards collection.

N. pyrophiloides Harv.*

1876. Harv., Can. Ent., VIII, 37, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 213, ? *Agrotis*.

HABITAT.—California.

The type is in the Henry Edwards collection. A well-named specimen, not the type, is in the British Museum.

The present location of the species is tentative merely.

Genus **CHORIZAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., 38, 98.

C. auxiliaris Grt.*

1872. Grt., Bull. Buff. Soc. Nat. Sci., I, 196, *Agrotis*.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 422, *Agrotis*.
1877. Grt., Bull. Geol. Surv., III, 118, *Agrotis*.

HABITAT.—Colorado, September; Texas in May; California; Utah in July.

The type is in the British Museum.

C. introferens Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 423, *Agrotis*.
1876. Harv., Bull. Buff. Soc. Nat. Sci., III, 74, pl. 3, f. 10, *Agrotis*.

HABITAT.—Colorado, August; Texas in May; California; Arizona.

The type is in Mr. Graef's collection.

C. soror Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 453, *Agrotis*.

HABITAT.—Montana; Texas, April and November.

The type is in the National Museum.

C. agrestis Grt.

1877. Grt., Bull. Geol. Surv., III, 118, var. *auxiliaris*.
mercenaria Grt.
1878. Grt., Bull. Geol. Surv., IV, 171, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 101, pr. syn.
flexilis Morr., MSS.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 101, pr. syn.

HABITAT.—Kansas; Colorado, August to October; California; Arizona; Texas, April and May; Nebraska; New Mexico.

The types of Mr. Grote's names are in the British Museum collection, and both refer to the same species. A specimen of *agrestis* marked "type," is also in the Museum of Comparative Zoölogy at Cambridge.

C. inconcinna Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 5, *Agrotis*.

HABITAT.—Arizona; Texas in May; Colorado, September.

The type is in the British Museum.

C. immixta Grt.*

1880. Grt., Bull. Geol. Surv., VI, 259, *Agrotis*.

HABITAT.—Texas in May.

The specimens named *immixta* in the National Museum agree with the type in the British Museum; those named *immixta* in the Neumoegen collection are *balinitis*. The species probably belongs to another genus. The preceding species, except the last, are closely related, but I think distinct. The separation of the species in the Revision is in accord with the types, all of which I have now seen. The National Museum series is correctly arranged.

C. balinitis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 97, pl. 3, f. 4, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 169 = *messoria*.

HABITAT.—Colorado; British Columbia.

I have utterly mistaken this species, as appears by the type in the British Museum. Mr. Grote has always associated it with *messoria* and compared it with that species, so that I naturally sought an ally of *messoria* to which the description could be applied. Specimens fully agreeing with Mr. Grote's type have been labeled *inconcinna* by me in Mr. Neumoegen's collection.

C. terrealis Grt.

1882. Grt., Trans. Kans. Ac. Sci., VIII, 47, *Agrotis*.

HABITAT.—New Mexico.

Types are with Prof. Snow and Mr. Neumoegen.

Genus **RHIZAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 103.

R. abnormis Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 41, *Agrotis*.

HABITAT.—Sierra Nevada, California.

The types are in the National Museum and in the Henry Edwards collection.

R. proclivis Smith.

1887. Smith, Proc. U. S. Nat. Mus., X, 453, *Agrotis*.

HABITAT.—Arizona.

The types are in the Tepper and Neumoegen collections

R. acclivis Morr.

1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 93, *Agrotis*.
opaca Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 72, pl. 3, f. 1, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 106, pr. syn.

HABITAT.—New York(?); Arizona; Texas; Colorada in May.

Dr. Harvey's type is in the British Museum and proves the correctness of my reference. The type of Mr. Morrison's species is in the Tepper collection.

R. albicosta Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 451, *Agrotis*.

HABITAT.—New Mexico; Arizona; Colorado, foothills.

The types are with Mr. Neumoegen and Mr. Graef. Others are in the National Museum.

R. apicalis Grt.

1880. Grt., Bull. Geol. Surv., VI, 153, *Agrotis*.

HABITAT.—Colorado; New Mexico.

The species does not seem to be represented in the British Museum. The type is with Mr. Neumoegen.

R. lagena Grt.*

1875. Grt., Can. Ent., VII, 26, *Agrotis*.

HABITAT.—Arizona; Montana; Utah; Nevada; California; Colorado.

The type is in the British Museum

R. albalis Grt.*

1878. Grt., Bull. Geol. Surv., IV, 175, *Agrotis*.
var. **cloanthoides** Grt.*
1880. Grt., Bull. Geol. Surv., VI, 153, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 108, pr. syn.

HABITAT.—Nevada; Colorado.

A specimen marked *albalis* type is in the British Museum, and another is in the Bailey collection. The two are not alike. The specimen in the British Museum collection has a very clear, bright, bluish white ground, while that in the Bailey collection has a more sordid appearance and is really a rather shabby specimen of *cloanthoides*, of which Mr. Graef has the type. I have recently received a Colorado specimen exactly like the type of *albalis*, and now consider it a good variety at least. A similar specimen is in the National Museum, labeled by Mr. Grote.

Genus PELTIA Wlk.

1856. Wlk., C. B. Mus., Het., IX, 203.

P. olivia Morr.

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 238, *Agrotis*.

HABITAT.—Utah.

The type is in the Tepper collection.

F. longidens Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 217, *Feltia*.

Habitat.—Las Vegas, New Mexico.

A type is with Mr. Neumoegen; another in the National Museum.

F. subgothica Haw.*

1810. Haw., Lep. Britt., 224, *Noctua*.
1829. Steph., Ill. Br. Ent., Haust., II, 126, pl. 22, f. 3, *Agrotis*.
1839. Wood, Index Ent., 36, pl. 9, f. 149, *Agrotis*.
1856. Fitch, 1st and 2d Rept. Ins. N. Y., 314, pl. 3, f. 1, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 99, *Agrotis*.
1874. Lint., Ent. Cont., III, 161, *Agrotis*.
1882. Riley, Papilio, II, 44, *Agrotis*.
1883. Saund., Fruit Insects, 328, f. 329, *Agrotis*.
jaculifera var., Gn.
1852. Gn., Sp. Gen., Noct., I, 262, pl. V, f. 4, *Agrotis*.
1856. Wlk., C. B. Mus., Het., X, 327, *Agrotis*.
1869. Riley, 1st Rept. Ins. Mo., 82, pl. I, f. 11, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 99, pr. syn.
1881. Riley, Index and Suppl. to Mo. Repts., 52, pr. syn.
1882. Riley, Papilio, II, 44, *Agrotis*.
ducens Wlk.
1856. Wlk., C. B. Mus., Het., IX, 203, *Feltia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 77, pr. syn.
1869. Beth., Can. Ent., I, 86, pr. syn.
1889. Butler, Trans. Ent. Soc. Lond., 377, pr. syn.
radiata Harr. Mss.
1891. Smith, List Lep. Bor. Am., 38, pr. syn.

Habitat.—United States and Canada. Northern States, July to September; Colorado, August.

I have not seen Haworth's work. The figure given by Stephens is a very poor one if it refers to our species; which I am very decidedly inclined to doubt.

F. jaculifera Gn.*

1852. Gn., Sp. Gen., Noct., I, 262, *Agrotis*.
1869. Riley, 1st Rept. Ins. Mo., 82, f. 29 *b*, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 99=*subgothica*.
1881. Riley, Index and Suppl. to Mo. Repts., 55=*tricosa*.
subgothica ‡ Pack.
1869. Pack., Guide, 306, f. 238, right-hand figure.
1883. Saund., Fruit Insects, 328, f. 329, right-hand figure.
tricosa Lint.
1874. Lint., Ent. Cont., III, 159, *Agrotis*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 5, *Agrotis*.
1882. Riley, Papilio, II, 44, an var. *subgothica*.
1883. Grt., Trans. Am. Phil. Soc., XXI, 156, an sp. dist.?
1889. Butler, Trans. Ent. Soc. Lond., 377, pr. syn.

Habitat.—United States, east of Rocky Mountains; Colorado; Canada. Northern States, July to September; Texas, October.

F. herilis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 99, *Agrotis*.
1874. Lint., Ent. Cont., III, 160, *Agrotis*.
1882. Riley, Papilio, II, 44=*subgothica* var.
1883. Grt., Proc. Am. Phil. Soc., XXI, 156, an sp. dist.
jaculifera var. B., Gn.
1852. Gn., Sp. Gen., Noct., I, 262, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 99, pr. syn.

HABITAT.—United States, east of Rocky Mountains; Canada; British Columbia. Northern States, July to September.

The three species last given are represented in the British Museum by good series, and the separation is in accord with my identifications in the National Museum. The types of *ducens* Wlk., *jaculifera* Gn., and *herilis* Grt., are in the English collection, that of *radiata* Harris, is in the collection of the Boston Society of Natural History, and that of *tricosa* is in Dr. Lintner's collection.

F. pectinicornis Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 114, *Feltia*.

HABITAT.—Texas, March and October.

The types are in the U. S. National Museum.

F. evanidalis Grt.

1878. Grt., Bull. Geol. Surv., IV, 172, *Agrotis*.

HABITAT.—California.

The type in the British Museum is a good species, which I had not before seen. The antennæ are shortly pectinated, much as in the preceding, from which, however, it differs by greater size and brighter colors, which are more nearly like *subgothica* than any other.

F. circumdata Grt.

1883. Grt., Ann. & Mag. Nat. Hist., 1883, 53, *Agrotis*.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 54, *Agrotis*.

HABITAT.—New Mexico.

I do not know where the type is at present.

F. gladiaria Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 162, *Agrotis*.
1875. Morr., Proc. Acad. Nat. Sci. Phil., 1875, 59, *Agrotis*.
1880. Grt., Bull. Geol. Surv., VI, 163, *Agrotis*.
morrisoniana Riley.
1874. Riley, Proc. Bost. Soc. N. H., XVII, 286, *Agrotis*.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 214, *Agrotis*.

HABITAT.—United States, east of Rocky Mountains; Northern States in September; Texas in October.

Mr. Morrison's type is in the Tepper collection; that of Dr. Riley is in the National Museum. In the British Museum is a specimen labeled *morrisoniana* "type," in Mr. Grote's handwriting. It is correctly demined and came from Dr. Riley.

F. venerabilis Wlk.*

1856. Wlk., C. B. Mus., Het., x, 328, *Agrotis*.

Habitat.—Canada; United States generally; New York in September; Texas in November; California and Colorado in October.

The type is in the British Museum. Messrs. Grote and Robinson in 1869 and Mr. Butler in 1889 referred *Agrotis incallida* Wlk., as a synonym of the above. The type is a badly rubbed specimen; but it is undoubtedly *Hadena* (*Luperina*) *passer* Gn., and not an *Agrotis* at all.

F. gravis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 155, *Agrotis*.
1875. Grt., Can. Ent., VII, 25, *Agrotis*.
vapularis Grt.
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 81, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 118, pr. syn.

Habitat.—California.

Types of Mr. Grote's species are in the British Museum and confirm the above synonymy.

F. vancouverensis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 134, pl. 4, f. 4, *Agrotis*.
agilis Grt.
1888. Grt., Can. Ent., XX, 128, *Agrotis*.
hortulana Morr.
1875. Morr., Proc. Acad. Nat. Sci. Phil., 1875, 430, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 118, pr. syn.
semiclarata Grt.
1881. Grt., Can. Ent., XIII, 132, *Agrotis*.
1882. Grt., Ill. Essay, 52, pl. I, f. 9, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 378, pr. syn.

Habitat.—Vancouver; California in June; Colorado; Washington; Utah; Portland, Oregon, May and June.

The types of Mr. Grote's *vancouverensis* and *semiclarata* are in the British Museum, and refer to the same species. Mr. Morrison's type has been examined by me, but I have no memorandum as to its location. I think it is in the Cambridge Museum. The type of *agilis* is with Mr. Fletcher and does not refer to a distinct species. A specimen of *vancouverensis* marked type is also in the Hy. Edwards collection.

F. æneipennis Grt.*

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 81, *Agrotis*.
clodiana Grt.
1881. Grt., Papilio, I, 76, *Agrotis*.
1882. Grt., Ill. Essay, 52, pl. I, f. 10, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 118, = *vancouverensis*.

Habitat.—With *vancouverensis*. Alameda County, California, in May and June.

Types of both names are in the British Museum. I had referred *clodiana* to *vancouverensis* on the faith of specimens agreeing with Mr.

Grote's figure in the illustrated essay. This is utterly incorrect in color, and not at all a fair representation of the species, which does not differ from *æneipennis*. I would not be very greatly surprised if *vancouverensis* and *æneipennis* should prove forms of one very variable species.

F. volubilis Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 118, *Agrotis*.
stigmosa Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 163, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 121, pr. syn.

HABITAT.—United States and Canada; Northern and Eastern States in June and September; California in June; Portland, Oregon, May and June.

These two species are kept separated in the British Museum, extreme forms only being represented. Neither of the specimens seems to be a type. I do not know where Dr. Harvey's type is. Types of Mr. Morrison's species are in the Tepper and Neumoegen collections.

F. annexa Tr.*

1825. Tr., Schmett. Eur., V, 154, *Agrotis*.
1829. Steph., Ill. Br. Ent. Haust., II, 117, pl. 22, f. 2, *Agrotis*.
1856. Wlk., C. B. Mus., Het., X, 328, *Agrotis*.
1852. Gn., Sp. Gen., Noct., I, 268, *Agrotis*.
1882. French, Can. Ent., XIV, 207, life history.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 378, *Agrotis*.
decernens Wlk.
1856. Wlk., C. B. Mus., Het., X, 333, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 378, *Agrotis*.

HABITAT.—Massachusetts in September; New York, July and August; south and west to Florida; Texas, March and December; California in October; South America.

The type of Walker's species is in the British Museum. Mr. Butler also cites *anteposita* Gn., Noct., I, 278, as a synonym, and perhaps correctly so. I have not seen a typical example, and as the species is described from South America, deemed it of insufficient importance to warrant much search. There is a considerable South and Central American bibliography to this species which it is not necessary to give here.

F. malefida Gn.*

1852. Gn., Sp. Gen., Noct., I, 267, *Agrotis*.
1856. Wlk., C. B. Mus., Het., X, 328, *Agrotis*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 5, *Agrotis*.

HABITAT.—Long Island, New York; New Jersey; south and west to Cuba and California; Florida in March; Texas, November and December.

The type is in the British Museum and proves the species correctly named in American collections.

Genus **POROSAGROTIS** Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 123.

P. vetusta Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 78, *Mythimna.*
1882. Grt., Ill. Essay, 41, ? = *murænula.*
murænula G. & R.
1868. G. & R., Trans. Am. Ent. Soc., I, 352, *Agrotis.*
1869. Beth., Can. Ent., I, 86, *Agrotis.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 73, pl. 3, f. 3, *Agrotis.*

HABITAT.—Canada; United States, west to Colorado, south to Georgia; New York, July and August; Massachusetts, August and September.

Walker's type is without question this well-known species of Grote & Robinson. The type of the latter authors is in the collection of the American Entomological Society labeled by Mr. Grote, though not marked "type."

P. catenula Grt.*

1879. Grt., No. Am. Ent., I, 44, *Agrotis.*

HABITAT.—Colorado, Glenwood Springs, October, Denver in June; Montana; New Mexico; California, in October.

The type is in the British Museum.

P. obesula Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 456, *Agrotis.*

HABITAT.—Montana; Colorado.

The type is in the National Museum.

P. satiens Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 45, *Agrotis.*

HABITAT.—Northwest British Columbia; Colorado.

The types are with Mr. Neumœgen, and in the Coll. U. S. National Museum.

P. mimallonis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 98, *Agrotis.*
1878. Grt., Bull. Geol. Surv., IV, 175, *Agrotis.*
rufipennis Grt.
1875. Grt., Can. Ent., VII, 83, *Agrotis.*
1875. Grt., Can. Ent., VII, 226, pr. syn.

HABITAT.—Montana; Colorado; New York, in August; Canada.

The type of *rufipennis* is in the British Museum. *Mimallonis* was described from the Meade collection.

P. fusca Bdv.

1834. Bdv., Ic. Hist. de. Lepid., pl. 48, f. 4, *Agrotis.*
1864. Mœschl., Wien. Ent. Monatschr., vi, 197, *Agrotis.*
    ♂ *septentrionalis* Moeschl.
1862. Mœschl., Wien. Ent. Monatschr., iv, 133, pl. i, f. 3, *Agrotis.*
1870. Mœschl., Stett. Ent. Zeit., xxxi, 268, pr. syn.
    patula Wlk.
1856. Wlk., C. B. Mus., Het., x, 329, *Agrotis.*

HABITAT.—Labrador; Rocky Mountains.

Walker's type is in the British Museum, and agrees fully with specimens of *septentrionalis* sent me by Mœschler as typical, years ago. I have never before seen it from the Rocky Mountains, and there is a margin of possibility that larger material will develop points of difference that I do not find now.

P. tripars Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 78, *Mythimna.*
1882. Grt., Ill. Essay, 41, ? an *Agrotis.*
    worthingtoni Grt.
1880. Grt., No. Am. Ent., i, 91, *Agrotis.*

HABITAT.—New York; Indiana.

The types of both names are in the British Museum. The species is a familiar one to me; but I had, following Mr. Morrison, doubtfully identified it with *Eucoptocnemis fimbriaris* Gn., than which it is narrower winged with almost the same maculation. Its association with the species of this genus is probably correct; but I have had no opportunity to examine a male critically. I have a specimen compared with the type. The National Museum specimens are under the name *Eucoptocnemis fimbriaris*, labeled by Mr. Morrison.

P. rileyana Morr.*

1874. Morr., Proc. Bost. Soc. N. H., xvii, 166, *Agrotis.*
1875. Morr., Proc. Acad. Nat. Sci. Phil., 58, *Agrotis.*

HABITAT.—New York; Illinois; Missouri; Kansas; New Mexico; Colorado; Texas.

A specimen marked "type" is in the British Museum; others are in the National Museum and in the Tepper and other collections, all referring to the same species. Mr. Morrison was very liberal in marking types of this species.

P. texana Grt.

1863. Grt., Proc. Ent. Soc. Phil., ii, 273, pl. vi, f. 2, *Agrotis texanus.*
1881. Grt., Papilio, i, 127, 153, ?=*segetum.*
1883. Grt., Papilio, iii, 76, an sp. dist.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 154, *Carneades.*

HABITAT.—Texas.

The types, ♂ and ♀, are in the collection of the American Entomological Society. In the British Museum is a specimen labeled *texana* by

Mr. Grote, which is not the same species. The insect is from Tucson, Ariz., and is from Mr. Neumœgen's collection. In that collection are other specimens also labeled *texana* and from them I drew the character for the species, in my revision. I had not been able at that time to find the type in the Philadelphia collection; but a recent systematic search discovered the specimens under a misleading label. Indeed, but for the fact that one of the specimens was obviously the original of the figure above cited, they could not have been identified with certainty at all. As it is, the type proves a *Porosagrotis* instead of a *Carneades*, and the insect I described in my revision lacks a name. The ♂ antennæ are pectinated, secondaries white in the male, only a little soiled in the female. The claviform is obvious. It is between *rileyi* and *orthogonia*, differing obviously from either. The types have no locality labels, and I have no information as to who collected them. It is possible that it may prove more nearly related to my *obesula* than I now believe, when abundant material is at hand.

P. orthogonia Morr.*

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 239, *Agrotis*.

HABITAT.—Colorado; New Mexico; Nebraska; Arizona; Utah.

I have not seen the type.

P. dædalus Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 217, *Porosagrotis*.

HABITAT.—Colorado.

Types are in the National Museum.

P. dollii Grt.

1882. Grt., Can. Ent., XIV, 216, *Agrotis*.

HABITAT.—Arizona.

The types are with Mr. Neumoegen.

P. milleri Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 78, pl. 4, f. 4, *Agrotis*.

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

P. pluralis Grt.*

1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis*.
1880. Grt., Bull. Geol. Surv., VI, 144, *Agrotis*.
1882. Grt., Ill. Essay, 55, pl. 2, f. 16, *Agrotis*.

HABITAT.—Nevada; Colorado.

A specimen marked "type" is in the British Museum; another, marked in the same way, is in the Bailey collection.

Genus **CARNEADES** Grt.

1883. Grt., Can. Ent., xv, 4.

C. wilsonii Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 135, pl. 4, f. 3, *Agrotis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 62, *Agrotis*.
specialis Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 62, *Agrotis*.
1882. Grt., Ill. Essay, 54, pl. 2, f. 14, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 133, pr. syn.
æqualis Harv.
1876. Harv., Can. Ent., VIII, 36, *Agrotis*.

HABITAT.—California, August and September; Glenwood Springs, Colorado, September.

Types of each of the above names are in the British Museum. *Specialis* is simply a color variety of *wilsonii*, between which every intermediate form exists. The type of *æqualis* is a rubbed and somewhat imperfect specimen, with the markings consequently less defined. The species is an excessively variable one. A "type" of *wilsonii* is also to be found in the Museum of Comparative Zoölogy, Cambridge.

C. lacunosa Grt.*

1878. Grt., Bull. Geol. Surv., IV, 172, *Agrotis*.

HABITAT.—California.

Mr. Grote says the type is in the collection of the Buffalo Society of Natural Science. A specimen labeled by Mr. Grote is in the British Museum.

C. recula Harv.*

1876. Harv., Can. Ent., VIII, 37, *Agrotis*.

HABITAT.—Oregon; Colorado.

A type specimen is in the British Museum; others are in the Edwards collection.

C. cicatricosa G. and R.*

1865. G. and R., Proc. Ent. Soc. Phil., IV, 492, pl. 3, f. 4, *Agrotis*.

HABITAT.—Colorado.

A specimen named by Mr. Grote is in the British Museum; the type is in the collection of the American Entomological Society.

C. neomexicana Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 218, *Carneades*.

HABITAT.—New Mexico.

Types are in the National Museum and the collections of Neumoegen and Hulst, the latter now at Rutgers College.

C. quadridentata G. and R.*

1865. G. and R., Proc. Ent. Soc. Phil., IV, 491, pl. 3, ff. 2 and 3, *Agrotis*.

HABITAT.—Colorado; Oregon.

A specimen named by Mr. Grote is in the British Museum; the type is in the collection of the American Entomological Society.

C. niveilinea Grt.*

1882. Grt., Can. Ent., XIV, 216, *Agrotis*.

HABITAT.—Arizona; New Mexico; Colorado; Nebraska; Texas in October.

Types are in the National Museum and in Mr. Neumoegen's collection.

C. insertans Smith.

1890. Smith, Trans. Am. Ent. Soc., XVII, 45, *Agrotis*.

HABITAT.—Spencer's Bridge, British Columbia.

The type is in Mr. Neumoegen's collection.

C. brevipennis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 455, *Agrotis*.

HABITAT.—California; Nevada; Colorado in September.

Types are in the National Museum collection and with Mr. Neumoegen.

C. oblongostigma Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 454, *Agrotis*.

HABITAT.—Montana; Black Hills; Colorado, Glenwood Springs, August.

Type specimens are in the National Museum, and in the collections of Graef, Neumoegen, and Hulst.

C. plagigera Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 163, *Agrotis*.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 57, *Agrotis*.

HABITAT.—Colorado, Glenwood Springs, August; Montana; Nevada; Kansas; Washington; Illinois; New York.

Specimens, not types, are in the British Museum; the type is in the Tepper collection.

C. olivalis Grt.*

1879. Grt., No. Am. Ent., I, 43, *Agrotis*.

HABITAT.—Colorado; Utah.

The type is in the British Museum, and is like the specimens so named in the National collection.

C. ridingsiana Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 305, *Agrotis*.

HABITAT.—Colorado, in May; Arizona; New Mexica.

The type is in the British Museum.

C. flavidens Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 455, *Agrotis*.

HABITAT.—Colorado, July; Arizona; New Mexico in August.

Types are in the National Museum, and in the collections of Graef and Neumoegen.

C. flavicollis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 456, *Agrotis*.

HABITAT.—Montana; Colorado; Arizona.

The type is in the Tepper collection.

C. bicollaris Grt.*

1878. Grt., Bull. Geol. Surv., IV, 173, 174, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, *Agrotis*.

HABITAT.—California; Nevada; Arizona.

The type is in the Edwards collection; I found no specimens in the British Museum.

C. brocha Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 56, *Agrotis*.
bochus Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 163, *Agrotis*.

HABITAT.—Colorado, August to October; Nevada; Kansas; Nebraska.

This species is placed under *Agrotis furcifera* Wlk., in the British Museum collections, in my opinion erroneously. Mr. Walker has also described a specimen as *Agrotis transversa*, which is almost certainly the same as Morrison's species. There are, however, several forms from Central or South America that come very close, and as careful and critical study would be required to decide specific limitations, for which I had not the time, I prefer leaving the name as it is, simply calling attention to the probabilities, and to the necessity for further study.

C. sponsa Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 457, *Agrotis*.

HABITAT.—Washington.

The type is in the National Museum.

C. cogitans Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 46, *Agrotis*.

HABITAT.—California; Colorado.

Types are in the National collection and with Mr. Neumoegen.

C. hollemani Grt.*

1874. Grt., Can. Ent., VI, 156, *Agrotis*.

HABITAT.—California; Arizona; Colorado, Glenwood Springs, August and September.

The specimen in the British Museum agrees with my identifications of the species, but is not the type. I have not seen the latter.

C. atristrigata Smith.

1890. Smith, Ent. Amer., VI, 76, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 150, *Carneades*.

HABITAT.—Northwest British Columbia.

The type is with Mr. Neumoegen.

C. biclavis Grt.*

1879. Grt., Bull. Geol. Surv., V, 206, *Agrotis*.
1882. Grt., Ill. Essay, 53, pl. I, f. 12, *Agrotis*.

HABITAT.—Arizona.

The type is in the British Museum. It is a very distinct, brightly marked form and is correctly located in my revision.

C. perpolita Morr.*

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 237, *Agrotis*.
1878. Lint., Ent. Cont., IV, 123, *Agrotis*.

HABITAT.—New York in August, and northward; Colorado, Glenwood Springs, August.

The type is in the Tepper collection.

C. fumalis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 98, *Agrotis*.
1878. Grt., Bull. Geol. Surv., IV, 174, *Agrotis*.
permunda Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 163, *Agrotis*.
1880. Grt., Bull. Surv., VI, 151, pr. syn.

HABITAT.—Northern, Eastern, and Middle States; District of Columbia; Canada; Massachusetts in August.

A specimen labeled *permunda* is in the National Museum, from the Meske collection, and the British Museum specimen labeled *fumalis* by Mr. Grote, is the same. It is not the type.

C. perfusca Grt.

1883. Grt., Papilio, III, 77, *Agrotis*.

HABITAT.—California; Colorado; Arizona.

The type is with Mr. Graef.

C. detersa Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 212, ? *Charæas.*
pitychrous Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 82, *Agrotis.*
1889. Beutenmuller, Ent. Amer., v, 38, larva.
personata Morr.
1876. Morr., Proc. Bost. Soc. N. H., XVIII, 238.
1880. Grt., Can. Ent., XII, 187, pr. syn.

HABITAT.—Nova Scotia; Canada; Northern, Eastern, Middle, and Central States; Colorado, Glenwood Springs, September; Northern States, July, August, and September.

Walker's type in the British Museum is like an average *pitychrous*, such as is also in the collection from the Grote material. The type of *personata* is in the Tepper collection, and is a small fully marked specimen, such as is occasionally found throughout the range of the species. The type of *pitychrous* is with Dr. Lintner.

C. infracta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 115, *Agrotis.*

HABITAT.—Colorado; Texas.

The type is in the Tepper collection.

C. luteola Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 457, *Agrotis.*

HABITAT.—Arizona.

The type is in Mr. Neumoegen's collection.

C. serricornis Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 458, *Agrotis.*

HABITAT.—Southern California.

The type is in the Tepper collection.

C. tetrica Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 458, *Agrotis.*

HABITAT.—Texas; Nevada.

Types are in the Bailey collection.

C. bostoniensis Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 203, *Agrotis.*
1876. Harv., Bull. Buff. Soc. Nat. Sci., III, 74, pl. 3, f. 7, *Agrotis.*

HABITAT.—Middle, Eastern, and Northern States; Canada; Massachusetts in September; New York in October.

The type is in the British Museum.

C. cænis Grt.*

1879. Grt., No. Am. Ent., I, 44, *Agrotis.*
muscosa Grt.
1883. Grt., Can. Ent., XV, 26, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., x, 460, pr. syn.

HABITAT.—Colorado, Glenwood Springs, August to October; New Mexico.

The type of *cœnis* is in the British, that of *muscosa* in the U. S. National Museum. The two are of the same species. A type of *cœnis* is also in the Neumoegen collection.

C. medialis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 459, *Agrotis*.

HABITAT.—Texas, October and November; Colorado.

The types are in the National Museum.

C. feniseca Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 74, pl. 3, f. 6, *Agrotis*.
1875. Grt., List Noctuidæ, 25, *Agrotis*.

HABITAT.—California.

The type is in the British Museum.

C. extranea Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 459, *Agrotis*.

HABITAT.—Montana.

The type is in the Tepper collection.

C. trifasciata Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 460, *Agrotis*.

HABITAT.—Mount Hood, Oregon.

The types are in the Tepper and Graef collections.

C. bifasciata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 460, *Agrotis*.

HABITAT.—Arizona.

The type is in the National Museum.

C. comosa Morr.

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 238, *Agrotis*.

HABITAT.—Colorado.

The type is in the Tepper collection. A specimen labeled *comosa* by Mr. Grote, is in the British Museum, and is not like the type. It is nearer to my *incallida*, from which it differs obviously, and is probably undescribed.

C. sculptilis Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 271, *Agrotis*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 73, pl. 3, f. 2, *Agrotis*.
1882. Grt., New List Lepid., *Ammaconia*.
1887. Grt., Can. Ent., XIX, 44, *Rich'a*.
xyliniformis Smith.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 221, *Carneades*.

HABITAT.—Texas, in October; New Mexico.

Dr. Harvey's type is in the British Museum, and is like the type of *xyliniformis* in the National Museum. Dr. Harvey's figure is poor and does not suggest this species at all. Mr. Grote's reference of the species to *Ammaconia* prevented all chance of my recognizing it. It has nothing at all in common with the other species referred to that genus.

C. messoria Harr.*

1841. Harr., Rept. Ins. Mass., *Agrotis.*
1862. Harr., Inj. Ins., Flint ed., 444, *Agrotis.*
1885. Riley, Ent. Amer., I, 176, *Agrotis.*
spissa Gn.
1852. Gn., Sp. Gen., Noct., I, 261, *Agrotis.*
1856. Wlk., C. B. Mus., Het., X, 327, *Agrotis.*
1877. Grt., Can. Ent., IX, 28, pr. syn.
1880. Grt., Bull. Geol. Surv., VI, 566, *Agrotis.*
1889. Butler, Trans. Ent. Soc. Lond., 379, pr. syn.
lycarum ‡ Grt.
1874. Grt., Can. Ent., VI, 155, *Agrotis.*
cochrani Riley.
1868. Riley, Prairie Farmer, July, 1868, *Agrotis.*
1869. Riley, 1st. Rept. Ins. Mo., 75, *Agrotis.*
1874. Grt., Can. Ent., VI, 214, pr. syn.
1881. Riley, Index and Supplt. to Mo. Repts., 76, pr. syn.
1881. Grt., Papilio, I, 126, pr. syn.
1882. Riley, Papilio, II, 41, *Agrotis.*
1883. Saund., Fruit Insects, 107, f. 104, *Agrotis.*
repentis G. & R.
1868. G. & R., Trans. Am. Ent. Soc., I, 350, pl. 7, f. 58, *Agrotis.*
1873. Grt., Bull. Buff. Soc., Nat. Sci., I, 96, *Agrotis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 53 = *cochrani.*
1881. Grt., Papilio, I, 126 = *messoria.*
confracta Morr. Mss.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 169, pr. syn.
displiciens Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 660, *Mamestra.*
1891. Smith, Can. Ent., XXIII, 119, pr. syn.
reticens Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 692, *Agrotis.*
1891. Smith, Can. Ent., XXIII, 119, pr. syn.
ordinata Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 691, *Agrotis.*
1891. Smith, Can. Ent., XXIII, 119, pr. syn.
inextricata Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 658, *Mamestra.*
1891. Smith, Can. Ent., XXIII, 120, pr. syn.
indirecta Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 659, *Mamestra.*
1891. Smith, Can. Ent., XXIII, 120, pr. syn.
septentrionalis Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 660, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 272, *Mamestra.*
inducta Wlk.
1857. Wlk., C. B. Mus., Het., X. 236, *Mamestra.*

HABITAT.—United States and Canada. Canada, June, July, and September; New York, Illinois, August and September; California, in September; Colorado, Glenwood Springs, August, September.

Harris's type is in the Boston Society of Natural History, where I have seen it. *Spissa* Gn., as determined by Walker, is the same species; but the type is not in the British Museum. Walker found this species a veritable silver mine, seven hard shillings being its value to him, and as many of his types are in the Museum. Dr. Riley's type is in the National Museum. Mr. Morrison's is in the Tepper collection.

The type of *repentis* is to be found in the collection of the American Entomological Society. *Inducta* was described from Venezuela, giving this species a very wide range.

C. pleuritica Grt.*

1875. Grt., Check List, 1875, 47, *Agrotis*.

HABITAT.—Canada; Maine; New Hampshire; northern New York. The type is in the British Museum.

C. drewseni Stgr.

1857. Stgr., Stett. Ent. Zeit., 1857, 302, *Agrotis*.

HABITAT.—Greenland.

The types, male and female, are in the Berlin Museum, and belong nearest to *pleuritica* in appearance. The wings are narrow, elongate in the specimen, and of a rather pale gray. I have seen something very like this from Colorado; but it is probably a different species.

C. choris Harv.

1876. Harv., Can. Ent., VIII, 37, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 158, *Carneades*.

HABITAT.—Nevada.

The type is in the British Museum. I had misidentified this species in my revision, and placed it next to *scandens*. It looks like a *messoria* with the lines almost obliterate and with white secondaries. The orbicular is oval, black-ringed; the reniform incomplete. The median shade line is obscure.

C. perturbata Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 222, *Carneades*.

HABITAT.—Colorado.

The type is in the National Museum.

C. rubefactalis Grt.*

1880. Grt., Bull. Geol. Surv., VI, 154, *Agrotis*.

HABITAT.—Washington; Colorado.

The type is in the British Museum.

C. fauna Morr.

1876. Morr., Proc. Bost. Soc. N. H., XVIII, 237, *Agrotis*.

HABITAT.—California.

The type, a miserable specimen, is in the Tepper collection.

C. brunneigera Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 80, *Agrotis*.
1880. Grt., Bull. Geol. Surv., VI, 260, *Agrotis*.

HABITAT.—California in September; Washington; Vancouver; Colorado; Louisiana.

The type is in the Edwards collection. Another, also marked "type," is in the British Museum.

C. conjuncta Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 221, *Carneades*.

HABITAT.—Las Vegas, New Mexico; Colorado.

The type is in Mr. Neumœgen's collection.

C. incallida Smith.

1890. Smith, Trans. Am. Ent. Soc., XVII, 50, *Agrotis*.

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

C. lutulenta Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 50, *Agrotis*.

HABITAT.—Sierra Nevada, California; Placer County, in September; Colorado, Glenwood Springs, August to October.

Types are in the National Museum; others in collection Edwards and Rutgers College.

C. annulipes Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 48, *Agrotis*.

HABITAT.—Oregon.

The type is in the National Museum.

C. pedalis Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 220, *Carneades*.

HABITAT.—Colorado.

The type is in the National Museum.

C. lineifrons Smith.*

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 219, *Carneades*.

HABITAT.—Colorado.

The type is in the National Museum.

C. teleboa Smith.

1890. Smith, Bull. U. S. Nat. Mus., No. 38, 219, *Carneades*.

HABITAT.—Las Vegas, New Mexico; Colorado.

The type is with Mr. Neumœgen.

C. murdocki Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 49, *Agrotis*.

HABITAT.—Utah, Fort Thornburgh; Northwest British Columbia; Oregon; Glenwood Springs, Colorado, in September.

A type is in the National Museum; another in Mr. Neumœgen's collection.

C. quinquelinea Smith.

1890. Smith, Trans. Am. Ent. Soc., XVII, 49, *Agrotis*.

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

C. friabilis Grt.*

1875. Grt., Can. Ent., VII, 187, pl. I, f. 5, *Agrotis*.

HABITAT.—New York; Maine; Canada in August; Colorado; California in June and August.

The type is in the British Museum. It is rather rubbed, and the resemblance to *bostoniensis*, mentioned by Mr. Grote, is more evident than I supposed possible from my material.

C. fuscigera Grt.*

1874. Grt., Can. Ent., VI, 155, *Agrotis*.

HABITAT.—California; Colorado, Glenwood Springs in September.

The type is in the British Museum.

C. orbicularis Smith.

1887. Smith, Proc. U. S. Nat. Mus., X, 460, *Agrotis*.

HABITAT.—Nevada.

The type is in the Tepper collection.

C. micronyx Grt.

1878. Grt., Bull. Geol. Surv., IV, 171, *Agrotis*.

HABITAT.—California.

The type is in the British Museum.

C. intrita Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 164, *Agrotis*.
1875. Grt., Can. Ent., VII, 68, *Agrotis*.

HABITAT.—Vancouver; California; Arizona.

Specimens named by Mr. Grote are in the British Museum. I have no notes as to the location of the type.

C. mollis Wlk.

1856. Wlk., C. B. Mus., Het. X, 331, *Agrotis.*
fernaldi Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 429, *Agrotis.*
1882. Grt., Ill. Essay, 53, pl. I, f. 11, *Agrotis.*

HABITAT.—Maine; St. Martins Falls, Albany River, Hudson Bay Territory; Colorado.

Walker's type is rather a small specimen; but is exactly like a specimen from the Grote collection, marked "type." Both are in the British Museum. I had previously seen the species in Mrs. Fernald's collection. I sincerely regret being compelled to make this reference. Mr. Neumœgen also has a "type" of Mr. Morrison's species. I was much interested to find a specimen of this species in the 1892 captures sent me by Mr. Bruce from Colorada.

C. opipara Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 165, *Agrotis.*
1875. Morr., Psyche, I, 42, *Agrotis.*
1875. Grt., Psyche, I, 77, 99 = *islandica.*
1875. Morr., Psyche, I, 85, an sp. dist., *islandica.*
1876. Grt., Stett. Ent. Zeit., XXXVI, 135 = *islandica.*
1885. Smith, Ent. Amer., I, 15, an sp. dist., *islandica.*
1885. Smith, Stett. Ent. Zeit., XLVI, 223, *Agrotis.*
labradoriensis Stgr.
1881. Stgr., Stett. Ent. Zeit., XLII, 419, *Agrotis.*
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Agrotis.*
1885. Smith, Stett. Ent. Zeit., XLVI, 223, pr. syn.
islandica ‡ Auct.
1876. Grt., Stett. Ent. Zeit., XXXVI, 135, *Agrotis.*
1878. Pack., Bull. Geol. Surv., IV, 555, pl. f. 10, *Agrotis.*
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Agrotis.*
1885. Smith, Stett. Ent. Zeit., XLVI, 223, pr. syn.

HABITAT.—Mount Washington, New Hampshire; Labrador.

The type, or a specimen so marked, is in the British Museum and agrees fully with specimens in American collections. In Staudinger's collection, at Dresden, I saw his types of *labradoriensis*, and they are undoubtedly the same as *opipara*. They are as unquestionably distinct from the true *islandica*, the type of which I had the chance of comparing with it.

C. tristicula Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 429, *Agrotis.*

HABITAT.—Orono, Maine.

I have seen only one specimen, typical, though not the type from Mrs. Fernald's collection. The type is with Mr. Neumœgen.

C. munis Grt.*

1879. Grt., No. Am. Ent., I, 38, *Agrotis.*
sublatis Grt.
1880. Grt., No. Am. Ent., I, 91, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 184, pr. syn.

HABITAT.—Colorado, Glenwood Springs in October; Nevada; New Mexico.

The type of *munis* is in the British Museum; that of *sublatis* is in the Hulst collection. They undoubtedly refer to the same species.

C. dissona Moeschl.

1860. Moeschl., Wien. Ent. Monatschr., IV, 365, pl. 9, f. 4, *Agrotis.*
1885. Smith, Ent. Amer., I, 14, *Agrotis.*
1885. Smith, Stett. Ent. Zeit., XLVI, 223, *Agrotis.*
rava ‡ Pack.
1868. Pack., Proc. Bost. Soc. N. H., XI, 38, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 184, pr. syn.

HABITAT.—Labrador.

Mr. Moeschler was good enough to send me type specimens for study. In the Staudinger collection is quite a good series showing no small amount of variation. The tendency is all in the direction of *opipara*, from which it really differs only in lacking the black shades and lines.

C. vetusta Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 662, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 274, *Mamestra.*
tetra Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 768, *Lepipolys.*
euroides Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 202, *Agrotis.*
perpura Morr.
1874. Morr., Pr. Bost. Soc. N. H., XVII, 164, *Agrotis.*
1880. Grt., Bull. Geol. Surv., VI, 151 = *euroides.*

HABITAT.—California; Washington; Vancouver.

Types of the Walker and Grote species are in the British Museum. All the names refer to one form.

C. alticola Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 51, *Agrotis.*

HABITAT.—Sierra Nevada, California; Colorado.

Types are in the National Museum and in the Edwards collection.

infausta Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 729, *Hadena.*
rufula Smith.
1887. Smith, Proc. U. S. Nat. Mus., X, 461, *Agrotis.*

HABITAT.—Vancouver; New Mexico, 7,000 feet, in July; Colorado, Hall Valley in August.

The type of Walker's species is in the British Museum; of my own, specimens are in the National Museum and with Prof. Snow. There is, unfortunately, no doubt that the names refer to the one species.

C. basiflava Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 52, *Agrotis.*

HABITAT.—Northwest British Columbia; South Park, Colorado.

Types are in the National Museum and in the Neumœgen coll

C. satis Harv.

1876. Harv., Can. Ent., VIII, 36, *Agrotis*.

HABITAT.—California; Nevada; Montana.

I have not found the type of this species. It was described out of the Edwards collection, and the specimens there named are probably as typical as can be asked.

C. rena Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 53, *Agrotis*.

HABITAT.—Sierra Nevada, Placer County, in September, California. Types are in the National Museum, and in the Edwards collection.

C. insulsa Wlk.*

1856. Wlk., C. B. Mus., Het., IX, 234, *Mamestra*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., II, 15, *Hadena*.
1883. Grt., Ill. Essay, 43, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 208, *Agrotis*.
insignata Wlk.
1856. Wlk., C. B. Mus., Het., X, 330, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 379, *Agrotis*.
expulsa Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 661, *Mamestra*.
declarata Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 663, *Mamestra*.
1882. Grt., Ill. Essay, 43, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 156, *Agrotis*.
1885. Saund., Can. Ent., XVII, 32, *Agrotis*.
1888. Butler, Trans. Ent. Soc. Lond., 1889, 379 = *insignata*.
tritici ‡ Gn.
1852. Gn., Sp. Gen., Noct., I, 228, *Agrotis*.
1856. Wlk., C. B. Mus., Het., X, 321, *Agrotis*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 379 = *insignata*.
decolor Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 162, *Agrotis*.
1875. Morr., Can. Ent., VII, 214, *Agrotis*.
1877. Morr., Bull. Buff. Soc. Nat. Sci., III, 212, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 190 = *insignata*.
campestris Grt.
1875. Grt., Can. Ent., VII, 118, pl. I, f. 6, *Agrotis*.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 423, *Agrotis*.
1875. Morr., Can. Ent., VII, 214 = *decolor*.
1875. Grt., Can. Ent., VII, 227 = *decolor*.
1877. Grt., Bull. Geol. Surv., III, 118, *Agrotis*.
1878. Grt., Bull. Geol. Surv., IV, 175, *Agrotis*.
1889. Butler. Trans. Ent. Soc. Lond., 1889, 379 = *insignata*.
var. **verticalis** Grt.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 29, *Agrotis*.
1885. Smith, Can. Ent., XVII, 6 = *declarata*.

HABITAT.—Nova Scotia; Canada; northern United States from Atlantic to Pacific; Massachusetts in June; Canada in July; New York in August; California in September.

The types of the Walker and Grote names are all in the British Museum and they refer to one species only. *Insulsa* is a somewhat evenly colored form, with the cell but slightly contrasting; otherwise there is no difference. *Decolor* Morr., of which I have also seen the type, is the form in which there is considerable contrast between the light and dark shades, while in type *campestris* the color is even and the median lines become more marked.

C. tessellata Harr.*

1845. Harr., Rept. Ins. Mass., *Agrotis*.
1860. Harr., Inj. Ins., Flint. ed., 445, *Agrotis*.
1877. Grt., Bull. Geol. Surv., iii, 118, *Agrotis*.
1883. Saund., Fruit Insects, 328, f. 340, *Agrotis*.
maizi Fitch.
1856. Fitch, 2d Rept. Ins. N. Y., 313, *Agrotis*.
1865. Fitch, 9th Rept. Ins. N. Y., 237–249, pl. 4, f. 2 and 3, *Agrotis*.
1874. Grt., Can. Ent. vi, 118, pr. syn.
1878. Lint., Ent. Cont., iv, 122, pr. syn.
nigricans‡ Riley.
1869. Riley, 1st Rept. Ins. Mo., 87, *Agrotis*.
atropurpurea Grt.
1877. Grt., Bull. Geol. Surv., iii, 118, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 192, pr. syn.

Habitat.—United States; Canada in June and July; New York; Illinois, August and September; Colorado, Glenwood Springs, August to October.

Harris's type is in the Boston Society of Natural History. The type of Mr. Grote's species is in the British Museum, and is merely a small *tessellata*. It is a matter of the greatest surprise that Walker has not redescribed the species. I think he considered it a form of *tritici*.

C. albipennis Grt.*

1877. Grt., Bull. Buff. Soc. Nat. Sci., iii, 118, *Agrotis*.
1880. Grt., Bull. Geol. Surv., vi, 175, *Agrotis*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 156, *Agrotis*.
♀ *nigripennis* Grt.
1880. Grt., Bull. Geol. Surv., vi, 159, *Agrotis*.
1882. Grt., New List, 25, pr. syn.

Habitat.—Northern United States east of the Rocky Mountains; Colorado, Glenwood Springs in August; New Mexico; Canada; Massachusetts in September; New York in August.

The type is in the British Museum.

C. spectanda Smith.

1890. Smith, Trans. Am. Ent. Soc., xvii, 54, *Agrotis*.

Habitat.—California.

The type is with Mr. Neumœgen.

C. pallipennis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 461, *Agrotis.*

HABITAT.—Colorado, Glenwood Springs, September and October; Northwest British Columbia.

The types are in the National Museum, and in the collections of Graef and Tepper.

C. basalis Grt.*

1879. Grt., No. Amer. Ent., I, 38, *Agrotis.*

HABITAT.—Colorado.

The type is in the British Museum.

C. solitaria Smith.

1885. Smith, Stett. Ent. Zeit., XLVI, 223, *Agrotis.*
1887. Smith, Proc. U. S. Nat. Mus., x, 462, *Agrotis.*

HABITAT.—Labrador.

The type is in the Moeschler collection. The specimen was sent me ticketed "? *conflua* var."

C. nostra Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 55, *Agrotis.*

HABITAT.—Sierra Nevada, California.

Types are in the National Museum; other in the Edwards and Neumœgen collections.

C. ochrogaster Gn.*

1852. Gn., Spec. Gen., Noct., I, 327, *Noctua.*
1856. Wlk., C. B. Mus., Het., x, 408, *Ochropleura.*
1880. Grt., Bull. Geol. Surv., VI, 566, *Agrotis.*
illata Wlk.
1857. Wlk., C. B. Mus., Het., XI, 742, *Agrotis.*
1876. Grt., Can. Ent., VIII, 29, *Hadena.*
1877. Grt., Can. Ent., IX, 29=*Hadena suffusca.*
1890. Smith, Proc. U. S. Nat. Mus., XIII, 415, *Xylophasia.*
insignata ‖ Wlk.
1856. Wlk., C. B. Mus., Het., x, 353, *Agrotis.*
1856. Wlk., C. B. Mus., Het., XI, 742, n. b. l.
cinereomaculata Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 164, *Agrotis.*
1875. Grt., Can. Ent., VII, 226, *Agrotis.*
1875. Grt., Proc. Ac. Nat. Sci., 1875, 423, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 196, pr. syn.
gularis Grt.
1875. Grt., Proc. Ac. Nat. Sci., 1875, 424, *Agrotis.*
1890. Smith. Bull. U. S. Nat. Mus., No. 38, 196, pr. syn.
♀ *turris* Grt.
1875. Grt., Can. Ent., VII, 226, *Agrotis.*
1880. Grt., Bull. Geol. Surv., VI, 582, =*gularis.*

Habitat.—Canada in August; Northern and Eastern States; Michigan; Missouri; Colorado; Manitou in June; New York in July.

Mr. Grote has curiously mistaken Walker's species in referring it to *Hadena suffusca* Morr. It does bear a casual resemblance to Mr. Morrison's species; but the generic characters should have prevented the association. However, Mr. Morrison does furnish an exact synonym, for *illata* is almost precisely like *cinereomaculata*, the type of which I have seen. The types of Mr. Grote's species are in the British Museum. Guenée's type is in the Oberthür collection at Rennes.

Mr. Butler has placed a somewhat faintly marked specimen, labeled *turris* by Mr. Grote, under *saucia*, and has published them as identical.

C. idahoensis Grt.*

1878. Grt., Bull. Geol. Surv., IV, 171, *Agrotis*.

Habitat.—Idaho; Colorado; Nevada.

The type is in the British Museum.

C. furtivus Smith.*

1890. Smith, Trans. Am. Ent. Soc., XVII, 56, *Agrotis*.

Habitat.—California; Colorado, Glenwood Springs, August to October.

Types are in the National Museum and in Mr. Neumœgen's collection. It is more than likely that my species will prove a somewhat marked form of *idahoensis*, connected with the type by numerous intergrades; but I am not ready to make this reference positively at present.

C. westermanni Stgr.

1857. Stgr., Stett. Ent. Zeit., 1857, 303, *Agrotis*.

Habitat.—Labrador; Greenland.

The types are in the Berliner Museum. They indicate a somewhat variable species, tending toward the *obeliscoides* type; but all agreeing with the essential characters given in the "Revision."

C. obeliscoides Gn.*

1852. Gn., Spec. Gen., Noct., I, 293, *Agrotis*.
1856. Wlk., C. B. Mus., Het., X, 331, *Agrotis*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 9, =*obelisca*.
obelisca ‡ Wlk.
1856. Wlk., C. B. Mus., Het., X, 323, *Agrotis*.
sexatilis Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 100, *Agrotis*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 203, pr. syn.
1875. Grt., Can. Ent., VII, 102, pr. syn.

Habitat.—East of the Rocky Mountains, north of Georgia; New Mexico; South Park, Colorado, in September; New York and Massachusetts in August.

Guenée's type is in the British Museum. It is probable that two species are confused under this name; it needs further material to decide finally.

C. perexcellens Grt.*

1880. Grt., Bull. Geol. Surv., VI, 156, *Agrotis.*
excellens ‖ Grt.
1875. Grt., Trans. Am. Ent. Soc., V, 115, *Agrotis.*
1880. Grt., Bull. Geol. Surv., VI, 156, n. b. l.
infelix Smith.
1890. Smith, Trans. Am. Ent. Soc., XVII, 57, *Agrotis.*

HABITAT.—Colorado, Glenwood Springs in September; California, September and October; Oregon; Vancouver.

Mr. Grote's type in the British Museum is exactly like my types in Mr. Neumœgen's collection and in the National Museum. I am not at all satisfied that there is not a good species such as I have placed in the *4-dentata* series in the "Revision;" but Mr. Grote's type is unquestionably like my *infelix* and my name sinks. The species is an excessively variable one, and its exact limits are scarcely defined as yet.

C. islandica Stgr.

1857. Stgr., Stett. Ent. Zeit., 1857, 232, *Agrotis.*

HABITAT.—Iceland.

A good series of this species is in Staudinger's collection, and both sexes are also represented in the museum at Berlin. Like the surrounding species, this is extremely variable, resembling both *obeliscoides* and *tessellata.* The maculation is perhaps more like the latter; but the color contrasts are sharper, and the species as a whole is brighter. I can not understand why Staudinger considered his *labradoriensis* a variety. He has now associated it in the collection with *dissona*, which it resembles much more nearly. In the Grote collection in the British Museum is a specimen of *opipara* labeled *islandica* by Mr. Grote, and also a California species labeled in the same way. The latter is really much more nearly correct.

C. colata Grt.

1881. Grt., Can. Ent., XIII, 131, *Agrotis.*

HABITAT.—Mount Hood, Oregon; Sierra Nevada, California.

The type in the British Museum is a ♀ without fore legs; but evidently belongs here. The median lines are almost obsolete.

C. lewisi Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 137, pl. 4, f. 10, *Pleonectopoda.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 272, *Agrotis.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 303, *Agrotis.*

HABITAT.—Colorado.

The type is in the British Museum. It is not so near *tessellata* as the description indicates; but it is very near *colata*—so near indeed that except for the ground color there is little difference. It will probably result eventually that the two are identical. Since my return from England, Mr. Bruce has sent me this species for identification.

C. divergens Wlk.*

1856. Wlk., C. B. Mus., Het., x, 327, *Agrotis.*
versipellis Grt.
1875. Grt., Can. Ent., VII, 172, pl. I, f. 9, *Agrotis.*
1879. Grt., Bull. Geol. Surv., v, 206, *Agrotis.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 380, pr. syn.

HABITAT.—Northern States to Colorado; California in June; Canada in June; Maine and Massachusetts in July.

The types are in the British Museum, and Mr. Butler was quite correct in the synonymy given.

C. redimicula Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 165, *Agrotis.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 57, *Agrotis.*
1879. Strck., Rept. Chief Eng., 1878-'79, v, 1861, *Agrotis.*

HABITAT.—Northern States east of the Rocky Mountains; Canada; Colorado, Glenwood Springs, August to October; New York in June, July, August, and September; Massachusetts in August.

The type is in the Tepper collection.

C. strigilis Grt.

1876. Grt., Bull, Buff. Soc. Nat. Sci., III, 81, *Agrotis.*

HABITAT.—Vancouver.

The type is in the British Museum, and is a species I had not before seen. It is a very heavily built insect, like *redimicula* in general habitus, the whitish included spaces of median lines prominent.

C. fusimacula Smith.

HABITAT.—New Mexico.

The type is in the Rutgers College collection.

C. atrifera Grt.

1878. Grt., Bull. Geol. Surv., IV, 173, *Agrotis.*
1880. Grt., Bull. Geol. Surv., VI, 260, *Agrotis.*

HABITAT.—Sierra Nevada, California; Colorado, Glenwood Springs in September; Maine.

The type is in the British Museum.

C. tesselloides Grt.*

1880. Grt., Bull. Geol. Surv., VI., 566, *Agrotis.*

HABITAT.—California: Arizona; Montana; Colorado.

The type is in the British Museum.

C. silens Grt.*

1875. Grt., Can. Ent., VII, 67, *Agrotis.*

HABITAT.—California; Arizona; Nevada; Colorado.

The type is in the British Museum.

C. perlentans Wlk.

1856. Wlk., C. B. Mus., Het., x, 352, *Agrotis*.

HABITAT.—"New York."

I have not been able to find this species in the British Museum, nor has Mr. Butler been able to trace it. Messrs. Grote and Robinson saw it, and to them it suggested a rubbed *tritici*. It is quite likely to be either *tessellata* or *insulsa*, and is almost certainly a species known to us under another name.

Here ends the agrotid series. I have omitted *Agrotis vetusta* Wlk., of which the type is lost, and which can not possibly be made out from the description. The latter will be found in my "Revision" if anyone cares to try to identify it.

Genus **RICHIA** Grt.

1887. Grt., Can. Ent., XIX, 44.

Mr. Grote separates this from *Ammaconia*, I can not say at present how correctly, since I have no European material for comparison. If the characters given by Mr. Grote hold, the genus is probably good. They will not hold for *sculptilis*, certainly, for I redescribed that in *Agrotis*, to which it belongs. *Ammaconia* is by Lederer, Noct. Eur., 1857, 97.

R. chortalis Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 272, *Agrotis*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 5, 74, pl. 3, f. 9, *Ammaconia*.
1879. Grt., Bull. Geol. Surv., V, 207, *Agrotis*.
1887. Grt., Can. Ent., XIX, 44, *Richia*.

var. **aratrix** Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 74, pl. 3, f. 8, *Ammaconia*.
1879. Grt., Bull. Geol. Surv., V, 207, *Agrotis*.
1887. Grt., Can. Ent., XIX, 44, *Richia*, an dim. var. pr.

HABITAT.—Texas, in November; Arizona; Colorado, Glenwood Springs, September and October; New Mexico.

Types of both forms are in the British Museum. The exact relation of the two forms to each other is not yet known. They are not geographic races, nor seasonal varieties.

R. parentalis Grt.*

1879. Grt., No. Am. Ent., I, 44, *Agrotis*.
1881. Grt., Trans. Kans. Ac. Sci., VII, 66, *Agrotis*.
1882. Grt., Ill. Essay, 53, pl. I, f. 13, *Ammaconia*.
1887. Grt., Can. Ent., XIX, 44, *Richia*, et var. *decipiens*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383.

var. **decipiens** Grt.

1879. Grt., No. Am. Ent., I, 45, *Agrotis*.
1882. Grt., New List, 26, *Ammaconia*.
1887. Grt., Can. Ent., XIX, 44, *Richia*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 383, an var. *cuprea*.

HABITAT.—Colorado, Glenwood Springs, September and October; New Mexico.

Types of species and variety are in the British Museum. Mr. Butler suggests that these are the same as the European *Agrotis cuprea* and claims to have typical *cuprea* from Washington. It would take a great deal of comparison to convince me of the correctness of this reference.

R. distichoides Grt.

1883. Grt., Trans. Kans. Ac. Sci., VIII, 48, *Ammaconia.*

HABITAT.—New Mexico.

The type is with Prof. Snow.

Genus **ANYTUS** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 144

A. privatus Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 521, *Polia.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 384, *Anytus.*
sculptus Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 114, pl. 3, f. 1, *Xylina.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 145, *Anytus.*
1880. Grt., No. Am. Ent., I, 93, *Agrotis.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 384, pr. syn.
var. **planus** Grt.
1882. Grt., Can. Ent., XIV, 183, *Anytus.*

HABITAT.—Canada in August; Eastern and Middle States; Colorado; New York and New Hampshire, August and September.

Types of *privatus* and *sculptus* are in the British Museum, and Mr. Butler is correct in uniting them. The type of *planus* is in the Hill collection.

Mr. Butler thinks this is much nearer to *Pharætra*, an Arctiid, than to the Noctuidæ. I do not know *Pharætra;* but I have no serious doubt as to the correctness of the present location of *Anytus.*

Genus **EUCOPTOCNEMIS** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 13.

E. fimbriaris Gn.

1852. Gn., Spec. Gen., Noct., I, 172, *Heliophobus.*
1856. Wlk., C. B Mus., Het., IX, 208, *Heliophobus.*
1874. Morr., Proc. Bost. Soc. N. H., XVII, 134, *Pleonectopoda.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 13, *Eucoptocnemis.*
obvia Wlk.
1858. Wlk., C. B. Mus., Het., XV, 1707, *Graphiphora.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 384, pr. syn.

HABITAT.—North America; Massachusetts.

The types are in the British Museum, and represent a species I had never seen. I wonder whether Mr. Morrison really had this species before him when he wrote in 1874? I have seen specimens of *Agrotis worthingtoni* labeled *fimbriaris* in Mr. Morrison's handwriting in the National Museum and elsewhere, and the description given fits well to what I have seen of that species. Unfortunately the wing form which might decide is not given. In color and maculation *worthingtoni* and *fimbriaris* agree wonderfully well, and both have lengthily pectinated antennæ. But *fimbriaris* has oddly short, broad wings, while the others are normal for *Porosagrotis*. Walker's species has the "locality unknown."

Genus **AGROTIPHILA** Grt.

1875. Grt., Ann. Lyc. Nat. Hist., N. Y., XI, 107.

A. alaskæ Grt.*

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 84, pl. 4, f. 1, *Agrotis*.
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 54, *Agrotiphila*.

HABITAT.—Alaska.

The type is in the British Museum.

A. staudingeri Moeschl.*

1862. Moeschl., Wien. Ent. Monatschr., VI, 132, pl. I, f. 4, *Agrotis*.
1891. Smith, List Lepidoptera, 40, *Agrotiphila*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 133, *Agrotiphila*.
montana Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 95, *Agrotis*.
1875. Grt., Ann. Lyc. Nat. Hist., N. Y., XI, 107, *Agrotiphila*.
1875. Grt., List Noctuidæ, 17, *Agrotiphila*.
1891. Smith, List Lepidoptera, 40 = *staudingeri*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 133 = *staudingeri*.
detracta Wlk.

HABITAT.—Labrador; White Mountains; Montana; Colorado 12,000 feet, July 22 to August 12.

The type of *detracta* is in the British Museum; that of *staudingeri* I have seen by the courtesy of Mr. Moeschler, and there are specimens named by Moeschler in the Berlin Museum. Mr. Morrison's type is in the Tepper collection. These all refer to one species, no specimens from Colorado being in any collection. I have been unable to find any description for *detracta* Wlk., and it may be that the name will prove the earliest if it is at all published.

A. colorado Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 133, *Agrotiphila*.

HAITAT.—South Park, Colorado.

Types are in the National Museum and in the Neumœgen collection.

A. rigida Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 133, *Agrotiphila*.

HABITAT.—South Park, Colorado.

The type is in Mr. Neumœgen's collection.

This genus connects *Agrotis* with *Anarta*, and emphasizes also the Heliothine tendencies of *Porosagrotis* and *Carneades*.

Genus **PSAPHIDIA** Wlk.

1865. Wlk, C. B. Mus., Het., xxxii, 447.

Under the title *Dicopinæ*, the genera *Dicopis*, *Eutolype*, and *Copipanolis* are monographically treated by me in the Proceedings of the U. S. National Museum for 1892, Vol. xv, pp. 52–63. All the species are fully described there, and special reference to this paper is not made except where necessary to authenticate a species or give authority for a change. The generic term *Psaphidia* Wlk., must, under the rules, replace *Dicopis*, though not nearly so appropriate and certainly not as well described.

P. grotei Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., i, 274, *Valeria.*
1882. Smith, Bull. Bkln. Ent. Soc., v, 44, ? an *Valeria.*
1883. Grt., Proc. Am. Phil. Soc., xxi, 146, 168, *Copivaleria.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 54, *Dicopis.*

HABITAT.—Canada, Eastern, Middle, and Central States; April and May.

The type is in the British Museum.

P. resumens Wlk.*

1865. Wlk., C. B. Mus., Het., xxxii, 448, *Psaphidia.*
viridescens Wlk.
1865. Wlk., C. B. Mus., Het., xxxii, 601, *Cymatophora.*
1868. Grt. & Rob., Trans. Am. Ent. Soc., ii, 86, *Hadena.*
1882. Grt., Ill. Essay, 40, *Dicopis.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 55, ?=*muralis.*
muralis Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., App. 23, *Dicopis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 77, pl. i, f. 1, *Dicopis.*
1875. Grt., Stett. Ent. Zeit., xxxvi, 194, *Dicopis.*

HABITAT.—New York to Florida and Texas; Missouri in April; Texas in March; Massachusetts in April and May.

All the types are in the British Museum and refer to one species only. *P. resumens* was described as "near *Charadra*," and the latter as a Bombycid. A specimen of this same species also bears the name *Notodenta gemina.* In the Berliner Museum is a specimen labeled *Acronycta initialis*, without any name of author.

P. electilis Morr.

1875. Morr., Proc. Bost. Soc. Nat. Hist., xviii, 114, *Dicopis.*

HABITAT.—Pennsylvania.

I do not know this species and have not seen the type.

D. thaxterianus Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 196, *Dicopis.*
1881. Grt., Papilio, i, 48, *Dicopis.*

HABITAT.—Massachusetts in April; Texas.

The types are with Dr. Thaxter, and represent a very pretty species.

Genus **EUTOLYPE** Grt.

1874. Grt., Proc. Ac. Nat. Sci., Phil., xxvi, 198.

E. bombyciformis Smith.*

1892. Smith, Proc. U. S. Nat. Mus., xv, 58, *Eutolype*.

HABITAT.—Massachusetts to Missouri, in March.

The type is in the U. S. National Museum. It is the species usually labeled *Dicopis electilis* in collections.

E. depilis Grt.*

1881. Grt., Papilio, I, 48, *Dicopis*.
1892. Smith, Proc. U. S. Nat. Mus., xv, 58, *Eutolype*.

HABITAT.—New York to Ohio; Texas, in March.

The Texan specimen before Mr. Grote is now in the National Museum. The Ohio specimen, upon which the species is really based, is in Mr. Neumœgen's collection.

E. rolandi Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., xxvi, 198, *Eutolype*.
vernalis Morr.
1874. Morr., Proc. Bost. Soc. Nat. Hist., xvii, 133, *Copipanolis*.
1875. Grt., Can. Ent., vii, 17, pr. syn.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 210, pr. syn.

HABITAT.—Massachusetts in April; Missouri in April and May; Texas in February and March.

The type is in the British Museum.

E. damalis Grt.

1880. Grt., Bull. U. S. Geol. Surv., v, 208, *Dicopis*.
1881. Grt., Papilio, I, 49, *Dicopis*.
1892. Smith, Proc. U. S. Nat. Mus., xv, 60, *Eutolype*.

HABITAT.—California.

The type is in the Edwards collection.

Genus **COPIPANOLIS** Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., App., 25.

C. borealis Smith.

1892. Smith, Proc. U. S. Nat. Mus., xv, 61, *Copipanolis*.

HABITAT.—St. Anthony's Park, Minnesota, in April.

The type is in the collection of Mr. H. Schoenborn, of Washington, D. C.

C. cubilis Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., App., 25, *Copipanolis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 77, pl. I, f. 6, *Copipanolis*.
1875. Grt., Stett. Ent. Zeit., xxxvi, 197, *Copipanolis*.

Habitat.—Michigan, March; Massachusetts, March, April, May.

The type is in the British Museum. It agrees with the figure and description and is fully distinct from the Texan form usually named *cubilis* in collections.

C. fasciata Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 61, *Copipanolis*.

Habitat.—Missouri in April; Texas in January and February.

Types are in the National Museum. This is the species usually named *cubilis* in collections.

C. stigma Smith.

1890. Smith, Ent. Amer., VI, 220, *Copipanolis*.

Habitat.—Florida.

The type is in Mrs. Slosson's collection.

Genus BARATHRA Hbn.

1816. Hbn., Verzeichniss, 218.

A description of this genus and of the species referable to it, will be found in the Proc. U. S. Nat. Mus., XII, 457. *Copimamestra* Grt., has the same type as *Barathra* Hbn., and goes into the synonymy.

B. occidenta Grt.

1883. Grt., Ann. and Mag. Nat. Hist., 1883, 53, *Copimamestra*.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 55, *Copimamestra*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 458, *Barathra*.

Habitat.—New Mexico.

Types are with Prof. Snow and Mr. Neumœgen.

B. curialis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 470, *Copimamestra*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 458, *Barathra*.

Habitat.—Kittery Point, Maine; Franconia, New Hampshire.

The type is with Dr. Thaxter.

Genus ADMETOVIS Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 133.

A. oxymorus Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 133, pl. IV, f. 5, *Admetovis*.

Habitat.—Sierra Nevada, California; Colorado.

The type is in the Edwards collection. What Mr. Grote describes as the male is quite a different species which I have described as *Mamestra prodeniformis*. The right of *Admetovis* to generic rank is decidedly questionable.

Genus **MAMESTRA** Ochs.

1816. Ochs., Schmett. Eur., IV, 76.

A monographic revision of the species of this genus will be found in the Proc. U. S. Nat. Mus., XIV, 197–276, Pl. VIII—XI, 1891. This paper contains descriptions of all the species, but is not referred to in the bibliography save when necessary to establish synonymy or generic reference. Where not otherwise stated, my identifications are correct.

M. discalis Grt.*

1877. Grt., Bull. Geol. Surv., III, 797, *Mamestra*.

Habitat.—Colorado, Glenwood Springs, September and October; California; New Mexico.

The type is in the British Museum.

M. rogenhoferi Mœschl.

1870. Mœschl., Stett. Ent. Zeit., XXXI, 269, *Mamestra*.

Habitat.—Labrador.

The type is in the Mœschler collection.

M. nimbosa Gn.*

1852. Gn., Spec. Gen., Noct., II, 77, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 555, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 142, 349, *Mamestra*.

Habitat.—Canada; Northern, Eastern, and Middle States, June, July, and August; Colorado; British Columbia.

The type is in the British Museum.

M. imbrifera Gn.*

1852. Gn., Spec. Gen., Noct., II, 76, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 555, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 144, *Mamestra*.

Habitat.—Canada; Northern, Eastern, and Middle States in July; Colorado.

The type is in the British Museum.

M. purpurissata Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 82, pl. I, f. 5, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.
var. **juncimacula** Smith.*
1882. Smith, Bull. Bkln. Ent. Soc., V, 67, *Hadena*.
1891. Smith, Proc. U. S. Nat. Mus., XIV, 206, an var. pr.

Habitat.—Northern, Eastern, and Middle States; Utah; Colorado; July to September.

Mr. Grote's type is in the British Museum; mine is in the National Museum. A series of specimens received from Colorado, collected by Bruce, are all of the variety, indicating a geographical race at least.

M. insolens Grt.*

1874. Grt., Bull. Buff. Nat. Sci., II, 65, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*
♂ arietis Grt.
1879. Grt., Bull. Geol. Surv., V, 207, *Mamestra.*
1881. Grt., Can. Ent., XIII, 130, pr. syn.
carina, Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 158, *Tœniocampa.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 207, pr. syn.

HABITAT.—California; August and October.

Mr. Grote's types are in the British Museum. Mr. Morrison's is in the Tepper Collection.

M. leucogramma Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 140, *Dianthœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 64, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*

HABITAT.—California; April, August, October.

The types are in the Edwards collection and in the British Museum. Specimens exactly like them are in the National Museum.

M. lepidula Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 463, *Mamestra.*

HABITAT.—Texas.

The type is in the National Museum; a duplicate is in the Edwards collection.

M. determinata Smith.*

1891. Smith, Proc. U. S. Nat. Mus., XIV, 209, *Mamestra.*

HABITAT.—Colorado. foothills.

The type is in the National Museum.

M. meditata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 104, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*

HABITAT.—Canada to Virginia, west to the Mississippi; May, June, August, and September; Kansas, August.

The type is in the British Museum.

M. lustralis Grt.*

1875. Grt., Can. Ent., VII, 223, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 127, *Mamestra.*

HABITAT.—Canada to Virginia; west to Wisconsin and Colorado; Adirondacks in July.

The type is in the British Museum.

Genus MAMESTRA Ochs.

1816. Ochs., Schmett. Eur., IV, 78.

A monographic revision of the species of this genus will be found in the Proc. U. S. Nat. Mus., XIV, 197–276, Pl. VIII—XI, 1891. This paper contains descriptions of all the species, but is not referred to in the bibliography save when necessary to establish synonymy or generic reference. Where not otherwise stated, my identifications are correct.

M. discalis Grt.*

1877. Grt., Bull. Geol. Surv., III, 797, *Mamestra*.

HABITAT.—Colorado, Glenwood Springs, September and October; California; New Mexico.

The type is in the British Museum.

M. rogenhoferi Mœschl.

1870. Mœschl., Stett. Ent. Zeit., XXXI, 269, *Mamestra*.

HABITAT.—Labrador.

The type is in the Mœschler collection.

M. nimbosa Gn.*

1852. Gn., Spec. Gen., Noct., II, 77, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 555, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 142, 349, *Mamestra*.

HABITAT.—Canada; Northern, Eastern, and Middle States, June, July, and August; Colorado; British Columbia.

The type is in the British Museum.

M. imbrifera Gn.*

1852. Gn., Spec. Gen., Noct., II, 76, *Aplecta*.
1857. Wlk., C. B. Mus., Het., XI, 555, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 144, *Mamestra*.

HABITAT.—Canada: Northern, Eastern, and Middle States in July; Colorado.

The type is in the British Museum.

M. purpurissata Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 82, pl. I, f. 5, *Eurois*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Mamestra*.

var. **junctimacula** Smith.*

th, Bull. Bkln. Ent. Soc., V, 67, *Hadena*.
h, Proc. U. S. Nat. Mus., XIV, 206, an var. pr.

1 Northern, Eastern, and Middle States; Utah; Colorado;
Ju ber.

pe is in the British Museum: mine is in the National
M ies of specimens received from Colorado, collected by
R the variety, indicating a geographical race at least.

M. insolens Grt.*

1874. Grt., Bull. Buff. Nat. Sci., II, 65, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*
♂ arietis Grt.
1879. Grt., Bull. Geol. Surv., V, 207, *Mamestra.*
1881. Grt., Can. Ent., XIII, 130, pr. syn.
earina, Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 158, *Tæniocampa.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 207, pr. syn.

HABITAT.—California; August and October.

Mr. Grote's types are in the British Museum. Mr. Morrison's is in the Tepper Collection.

M. leucogramma Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 140, *Dianthœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 64, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*

HABITAT.—California; April, August, October.

The types are in the Edwards collection and in the British Museum. Specimens exactly like them are in the National Museum.

M. lepidula Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 463, *Mamestra.*

HABITAT.—Texas.

The type is in the National Museum; a duplicate is in the Edwards collection.

M. determinata Smith.*

1891. Smith, Proc. U. S. Nat. Mus., XIV, 209, *Mamestra.*

HABITAT.—Colorado. foothills.

The type is in the National Museum.

M. meditata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 104, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*

HABITAT.—Canada to Virginia, west to the Mississippi; May, June, August, and September; Kansas, August.

The type is in the British Museum.

M. lustralis Grt.*

1875. Grt., Can. Ent., VII, 223, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 127, *Mamestra.*

HABITAT.—Canada to Virginia; west to Wisconsin and Colorado; Adirondacks in July.

The type is in the British Museum.

M. detracta Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 733, *Hadena.*
claviplena Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 194, *Mamestra.*
1881. Grt., Can. Ent., XIII, 128, pr. syn.

HABITAT.—Canada, south to Virginia, west to Wisconsin, and New Mexico; Canada, in July; Massachusetts and New Jersey, in June.

Walker's type is in the British Museum; Mr. Grote's specimen is in the Lintner collection.

M. gnata Grt.*

1882. Grt., Can. Ent., XIV, 170, *Mamestra.*

HABITAT.—Arizona; New Mexico.

The type is in Mr. Neumœgen's collection.

M. distincta Hbn.*

1810. Hbn., Samml. Ex. Schmett., I, pl. 194, *Achatia.*
1816. Hbn., Verzeichniss, 219, *Astrapetis.*
1852. Gn., Spec. Gen., Noct., II, 91, *Hadena.*
1857. Wlk., C. B. Mus., Het., XI, 583, *Hadena.*
1868. G. & R., Trans. Am. Ent. Soc., II, 197, pl. 3, f. 72, *Hadena.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 156, *Mamestra.*
vitis French.
1879. French, Can. Ent., XI, 76, *Dicopis.*
1879. Grt., No. Am. Ent., I, 16, pr. syn.

HABITAT.—Canada to Texas; Illinois and Central States to central Colorado; Delaware in April.

M. crotchii Grt.

1880. Grt., Bull. Bkln. Ent. Soc., III, 29, *Mamestra.*
var. **fusculenta** Smith.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 213, *Mamestra.*

HABITAT.—Colorado; Oregon; California, in June.

The type of the species is in the British Museum. The type of the variety is in the National Museum.

M. farnhami Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 103, pl. 3, f. 2, *Mamestra.*

HABITAT.—Colorado, Glenwood Springs, in August.

A specimen marked "type" is in the British Museum; another marked in the same way is in the Edwards collection.

M. liquida Grt.*

1881. Grt., Papilio, I, 58, *Mamestra.*

HABITAT.—Washington; Oregon, May and June; Colorado.

The type is in the British Museum.

M. capsularis Gn.*

1852. Gn., Sp. Gen., Noct., II, 22, pl. 8, f. 3, *Dianthœcia.*
1857. Wlk., C. B. Mus., Het., XI, 505, *Dianthœcia.*
1881. Grt., Can. Ent., XIII, 128, *Mamestra.*
propulsa Wlk.
1857. Wlk., C. B. Mus., Het., XI, 529, *Raphia.*
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.

HABITAT.—Middle States; Maryland; Florida; Colorado; Kansas, in June.

The types of both the Guenée and Walker species are in the British Museum and were correctly referred by Mr. Grote. Mr. Walker's description has absolutely no applicability to this insect, which led me to doubt the correctness of the synonymy. The specimen in the National Museum is correctly identified.

M. vittula Grt.

1882. Grt., Trans. Kans. Acad. Sci., VIII, 48, *Mamestra.*

HABITAT.—New Mexico.

The type is with Mr. Neumœgen.

M. prodeniformis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., IX, 464, *Mamestra.*

HABITAT.—Southwest Arizona; New Mexico.

A type is in the National Museum; another with Mr. Neumœgen.

M. atlantica Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 12, *Mamestra.*
1875. Grt., Check List, Noct., 7, *Mamestra.*
1881. Grt., Can. Ent., XIII, 128, ?=*dissimilis.*
1889. Butler, Trans. Ent. Soc. Lond., 385=*dissimilis.*
w-latinum ‡ Gn.
1852. Gn., Sp. Gen., Noct., II, 105, *Hadena.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 12, pr. syn.
discolor Speyer.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 142, *Mamestra dissimilis* var.
1881. Grt., Can. Ent., XIII, 128, pr. var.
1882. Grt., New List, 26, pr. syn.

HABITAT.—Canada; Atlantic States to Virginia, west to Wisconsin; June, July, and August.

Mr. Grote's type is in the British Museum, placed under *dissimilis* by Mr. Butler. It will require an agreement in sexual structure to convince me of the identity of the American with the European species.

M. radix Wlk.*

1856. Wlk., C. B. Mus., Het., X, 332, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 210, *Agrotis.*
dimmocki Grt.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 420, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 269, *Mamestra.*
1891. Butler, Entomologist, XXIV, 240, pr. syn.
desperata Smith.
1891. Smith, Proc. U. S. Nat. Mus., XIV, 221, *Mamestra.*

HABITAT.—Nova Scotia; Hudson's Bay territory; Maine; New Hampshire; Colorado; Sierra Nevada, California.

The types of the Grote and Walker species are in the British Museum, and are the same as my *desperata*. Mr. Butler's reference was not made until October 1891, after my revision was published. I had had the species as *dimmocki*, and had so named it in the National Museum and elsewhere. Mr. Grote's description misled me and induced me to correct a supposed misidentification. The type is somewhat rubbed; but the M of the s. t. line is distinct, not wanting, as stated by Mr. Grote.

M. canadensis Smith.

1887. Smith, Proc. U. S. Nat. Mus., X, 464, *Mamestra*.

HABITAT.—New Brunswick.

The type is with Mr. Thaxter.

M. nevadæ Grt.

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 84, *Mamestra*.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 385=*thalassina*.

HABITAT.—Sierra Nevada, California.

This seems a good species, almost midway between *subjuncta* and *atlantica*. I had not seen it before, the specimen in the Edwards collection being erroneously named.

M. subjuncta G. and R.

1868. G. & R., Trans. Am. Ent. Soc., II, 198, pl. 3, f. 71, *Hadena*.
1869. Riley, 1st Rept. Ins. Mo., 84, pl. I, f. 14–17, *Hadena*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 282, *Mamestra*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 12, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 138, *Mamestra*.

HABITAT.—Canada; Northern, Eastern, and Middle States; Ohio; Minnesota; Colorado; Nebraska; New Mexico, June to September; Oregon, May and June.

A specimen, not the type, is in the British Museum.

M. grandis Bdv.

1840. Bdv., Gen. et Ind. Meth., 120, No. 950, *Hadena*.
1841. Gn., Noct. Ind. Meth., 244, *Hadena*.
1852. Gn., Spec. Gen., Noct., II, 105, pl. VIII, f. 10, *Hadena*.
1857. Wlk., C. B. Mus., Het., XI, 578, *Hadena*.
1857. Led., Noct. Eur., 90, *Mamestra*.
1883. Thaxter, Papilio, III, 17, *Mamestra*.
libera Wlk.
1856. Wlk., C. B. Mus., Het., IX, 179, *Xylophasia*.
1882. Grt., Ill. Essay, 44, pr. syn.

HABITAT.—Greenland; Lapland; Canada; Maine to Pennsylvania; west to Illinois, Wisconsin; Minnesota and Colorado, May, June, and October.

The arctic localities are from Walker, whose type is in the British Museum, and is what we know as *grandis.*

M. invalida Smith.*

1891. Smith, Proc. U. S. Nat. Mus., xiv, 225, *Mamestra.*

HABITAT.—Colorado; California—Sierra Nevada, Placer County in June; Portland, Oregon, May and June.

Types are in the National Museum and in the Edwards collection.

M. trifolii Rott.*

1776. Rott., Naturf., ix, 131, *Noctua.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 137, *Mamestra.*
chenopodii Fabr.
1787. Fabr., Mant. Ins., ii, 146, *Noctua.*
1793. Gmel., ed. Linn. Syst. Nat., 2542, *Noctua.*
1793. Fabr., Ent. Syst., iii, 2, 68, *Noctua.*
1811. Oliv., Enc. Meth., viii, 303, *Noctua.*
1816. Hbn., Verzeichniss, 219, *Diataraxia.*
1852. Gn., Spec. Gen., Noct., ii, 97, *Hadena.*
1857. Wlk., C. B. Mus., Het., xi, 570, *Hadena.*
1881. French, Can. Ent., xiii, 23, larva.
1881. Coquillett, Papilio, i, 7, *Mamestra.*
albifusa Wlk.
1857. Wlk., C. B. Mus., Het., xii, 753, *Hadena.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 104, *Mamestra.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 202, pr. syn.
1881. Grt., Can. Ent., xiii, 128, pr. syn.
glaucovaria Wlk.
1860. Wlk., Can. Nat. and Geol., v, 255, *Apamea.*
1877. Grt., Can. Ent., ix, 28, pr. syn.
major Speyer.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 138, pr. var.
1881. Grt., Can. Ent., xiii, 128, pr. var.
var. *oregonica* Grt.
1881. Grt., Can. Ent., xiii, 230, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., xiv, 227, pr. var.

HABITAT.—Europe and North America; May, June, August, and September.

The types of *albifusa* and *oregonica* are in the British Museum; that of *glaucovaria* is in the collection of the Ent. Soc. of Ontario. I have omitted *marmorosa* as a variety, because it does not agree with any of our forms, and may indeed be specifically distinct. Mr. Neumœgen also has a "type" of *oregonica.*

M. u-scripta Smith.*

1891. Smith, Proc. U. S. Nat. Mus., xiv, 228, *Mamestra.*

HABITAT.—Sierra Nevada, California; Colorado.

Types are in the National Museum and in the Edwards collection.

M. rosea Harv.

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 119, *Mamestra*.

HABITAT.—Canada; Northern and Eastern States; Colorado, Oregon, New York, and Massachusetts, in May and June.

The type is in the British Museum.

M. congermana Morr.*

1874. Morr., Can. Ent., VI, 106, *Hadena*.
1878. Grt., Bull. Geol. Surv., IV, 187, *Mamestra*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 39, *Mamestra*.

HABITAT.—Northern, Eastern, and Middle States; Colorado; May 12–26, in New York.

The type is in the Tepper collection.

M. rubefacta Morr.*

1874. Morr., Can. Ent., VI, 249, *Ceramica*.
1880. Grt., Can. Ent., XII, 185,=*Mamestra vindemialis*.
1881. Grt., Can. Ent., XIII, 128,=*M. vindemialis*.

HABITAT.—Canada; Eastern, Northern, and Middle States; May and June.

Mr. Grote's reference of this species to *vindemialis* Gn., is incorrect. The type of Guenée's species is in the British Museum, and is said to be from Florida, while I have never seen Mr. Morrison's species from south of Pennsylvania. I have referred *vindemialis* to *Tæniocampa*, where notes on it should be sought. I do not know where Mr. Morrison's type can be found.

M. picta Harr.*

1847. Harr., Rept. Ins. Mass., 329, *Mamestra*.
1862. Harr., Inj. Ins., Flint ed., 452, ff. 223, 224, *Mamestra*.
1870. Riley, 2d Rept. Ins. Mo., 112, f. 82, *Mamestra*.
1872. Lint., Ent. Cont., III, 137, *Mamestra*.
1882. Grt., Papilio, II, 99, *Mamestra*.
exusta Gn.
1852. Gn., Spec. Gen., Noct., I, 344, *Ceramica*.
1856. Wlk., C. B. Mus., Het., X, 417, *Ceramica*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, pr. syn.
contraria Wlk.
1856. Wlk., C. B. Mus., Het., IX, 78, *Mythimna*.
1868. G. & R., Trans. Am. Ent. Soc., II, 77, pr. syn.
1882. Grt., Ill. Essay, 41, pr. syn.

HABITAT.—Canada to Virginia; west to Nebraska; Wisconsin; Colorado; Canada in June; New York and New Jersey, June, August, and September.

Types of the Walker and Guenée names are in the British Museum and have been correctly referred to Harris's species. A type of *exusta* is also to be found in the Jardin des Plantes at Paris.

M. cristifera Wlk.*

1858. Wlk., C. B. Mus., Het., xv, 1654, *Acronycta.*
1882. Grt., Ill. Essay, 38, an *Hadenid?*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 385, *Mamestra.*
lubens Grt.
1875. Grt., Trans. Am. Ent. Soc., v, 113, *Mamestra.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., 425, *Mamestra.*
1875. Morr., Proc. Bost. Soc. N. H., xviii, 118, *Mamestra.*
1881. Grt., Can. Ent., xiii, 127, *Mamestra.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 385, pr. syn.
rufula ‖ Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 62, *Mamestra.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., 425, pr. syn.
1881. Grt., Can. Ent., xiii, 127, pr. syn.
brassicæ ‡ Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 103, *Mamestra.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 12, *Mamestra.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 62, pr. syn.
1875. Grt., Stett. Ent. Zeit., xxxvi, 341, pr. syn.

HABITAT.—Hudson's Bay Territory; Canada; Maine to Pennsylvania, west to Colorado; Oregon, May and June.

The types of the Walker and Grote species are in the British Museum and are the same.

M. assimilis Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., ii, 119, *Mamestra.*
1881. Goodell, Papilio, i, 15, larva.
var. **pulverulenta** Smith.
1887. Smith, Proc. U. S. Nat. Mus., x, 468, *Mamestra.*

HABITAT.—Canada; Northern and Eastern States; Northern New York in July; Massachusetts in June and July.

The type is in the Tepper collection; Mrs. Fernald has the type of the variety.

M. latex Gn.*

1852. Gn., Sp. Gen., Noct., ii, 78, *Aplecta.*
1857. Wlk., C. B. Mus., Het., xi, 556, *Eurois.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 103, *Mamestra.*
demissa Wlk.
1857. Wlk., C. B. Mus., Het., xi, 728, *Apamea.*
1868. G. & R., Trans. Am. Ent. Soc., ii, 78, pr. syn.
1882. Grt., Ill. Essay, 44, pr. syn.

HABITAT.—Canada; Northern, Eastern, and Middle States. May, June, July.

The types of both names are in the British Museum and have been correctly applied to the same species.

M. passa Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 139, *Mamestra.*
1875. Grt., Can. Ent., VII, 102, ? = *pensilis.*

HABITAT.—California.

The type is in the Tepper collection, and it is the only specimen thus far known to me.

M. adjuncta Bdv.*

1841. Bdv., in Gn., Noct. Ind. Meth., 243, *Miselia.*
1852. Gn., Spec. Gen., Noct., I, 199, *Mamestra.*
1856. Wlk., C. B. Mus., Het., IX, 234, *Mamestra.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 108, *Hadena.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 309, *Mamestra.*
1874. Lint., Ent. Cont., III, 161; larva on *Solidago.*
1877. Goodell, Can. Ent., IX, 60; larva on *Pteris aquilina.*
1884. Bean, Can. Ent., XVI, 68; larva on *Wigelia rosea.*

HABITAT.—Canada; Northern, Eastern, and Middle States, west to Illinois, Missouri, Minnesota. May, June, August, and October.

Types are in the British Museum, and in the Oberthür collections.

M. variolata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 467, *Mamestra.*

HABITAT.—Washington.

Types are in the National Museum and in Mr. Graef's collection.

M. glaciata Grt.

1882. Grt., Can. Ent., XIV, 170, *Mamestra.*

HABITAT.—Arizona; Colorado.

The type is with Mr. Neumoegen.

M. minorata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 467, *Mamestra.*

HABITAT.—California: Colorado.

The type is in the Edwards collection.

M. defessa Grt.*

1880. Grt., Can. Ent., XII, 88, *Mamestra.*

HABITAT.—California—May 22.

The type is in the British Museum.

M. chartaria Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 138, pl. 4, f. 12, *Mamestra.*

HABITAT.—California; Washington; Colorado; June.

A type is in the British Museum; another in the Cambridge collection.

M. repentina Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 118, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 242, *Mamestra.*

HABITAT.—West Hoboken, New Jersey.

The type is in Mr. Meyer's collection. I have in my Revision of the species doubted the American habitat of the species, but have had no opportunity of confirming my doubts.

M. brachiolum Harv.

1876. Harv., Can. Ent., VIII, 6, *Mamestra.*

HABITAT.—Texas; Arizona.

The type is in the British Museum.

M. beanii Grt.

1877. Grt., Can. Ent., IX, 87, *Mamestra.*
1879. Grt., No. Am. Ent., I, 12, *Mamestra.*

HABITAT.—Illinois; Texas; Colorado.

The type is in the British Museum. The species is correctly placed in my Revision; but the type is a much larger specimen than any I had seen.

M. legitima Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 82, pl. 2, f. 4., *Apamea.*
1874. Grt., Proc. Bost. Soc. N. H., XVI, 241, *Mamestra.*
1892. Edw. & Elliott, Bull. Am. Mus. N. H., IV, 77, larva.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States; June, July, August, September; Oregon, Portland in May.

The type should be, but is not, in the collection of the Amer. Ent. Soc. Dr. Riley has written the life history of this species and has figured it in his reports as U. S. Entomologist.

N. lilacina Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 119, *Mamestra.*
illabefacta Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 141, *Mamestra.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 211, pr. syn.
1875. Grt., Can. Ent., VII, 58, pr. syn.
1879. Grt., Can. Ent., XI, 128, pr. var.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States in July; Colorado; New Mexico.

The type of the species is in the British Museum. Mr. Morrison's type is in the Tepper collection, and another, also marked "type," is in the British Museum.

M. rugosa Morr.*

1875. Morr., Proc. Bost. Soc. Nat. Hist., XVIII, 119, *Mamestra.*

HABITAT.—Maine.

M. noverca Grt.*

1878. Grt., Can. Ent., x, 236, *Mamestra.*

HABITAT.—California; Colorado, Glenwood Springs in August; Arizona; Nebraska.

The type is in the British Museum.

M. goodelli Grt.*

1875. Grt., Can. Ent., VII, 223, *Mamestra.*

HABITAT.—Canada; Northern, Eastern and Middle States; west to Nebraska; May, June, July, August.

Mr. Grote's type is in the British Museum.

M. quadrata Smith.*

1891. Smith, Proc. U. S. Nat. Mus., XIV, 248, *Mamestra.*

HABITAT.—Placer County, California; June and July.

The types are in the National Museum.

M. obscura Smith.*

1891. Smith, Proc. U. S. Nat. Mus., x, 468, *Mamestra.*

HABITAT.—Wisconsin; ?Arizona.

The type is in the Tepper collection.

M. ectypa Morr.*

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 118, *Mamestra.*
bella Grt.
1883. Grt., Papilio, III, 30, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 249, pr. syn.

HABITAT.—New Jersey; West Virginia.

Mr. Morrison's type is in the Meyer collection; that of Mr. Grote's species with Mr. Neumœgen.

M. renigera Steph.*

1829. Steph., Ill. Brit. Ent., Haust., II, 16, *Celæna.*
1856. Wlk., C. B. Mus., Het., x, 262 = *herbimacula.*
1869. Riley, 1st Rept. Ins. Mo., 86, f. 31, *Mamestra.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 16, *Hadena.*
1874. Grt., Can. Ent., VI, 132, *Mamestra.*
1881. Riley, Index and Supplt. to Mo. Repts., 56, *Mamestra.*
1883. Edw., Papilio, III, 133; larva.
herbimacula Gn.
1852. Gn., Spec. Gen., Noct., I, 223, *Celæna.*
1857. Wlk., C. B. Mus., Het., x, 262, *Celæna.*
1874 Grt., Bull. Buff. Soc. Nat. Sci., II, 16, pr. syn.
infecta Wlk.
1856. Wlk., C. B. Mus., Het., x, 263, *Celæna.*

HABITAT.—Canada, south to Georgia and Mississippi, west to Nebraska; Colorado; May, June, July, August, September.

The types of *infecta* and *herbimacula* are both in the British Museum. Walker's type is quite a respectable specimen and should not have been doubtful.

M. stricta Wlk.*

1865. Wlk., C. B. Mus., Het., Suppl., III, 728, *Hadena?*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 386 = *Celæna egens.*
ferrea Grt.
1875. Grt., Can. Ent., VII, 25, *Mamestra.*
1881. Grt., Can. Ent., XIII, 130, *Mamestra.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 386, pr. syn.
var. **cinnabarina** Grt.*
1874. Grt., Proc. Bost. Soc. Nat. Hist., XVI, 241, *Mamestra.*

HABITAT.—California; Oregon; Washington; Vancouver, September, October.

The types of the above names are in the British Museum. Mr. Butler has referred them all as synonyms of *Celæna egens;* but *egens* is not a *Mamestra*, unfortunately; it is an *Hadena* allied in wing form to some of the smaller European forms. I have a specimen like Walker's type of *egens* from Colorado.

M. spiculosa Grt.

1883. Grt., Can. Ent., XVI, 28, *Mamestra.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

M. circumcincta Smith.

1891. Smith, Proc. U. S. Nat. Mus., XIV, 253, *Mamestra.*

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

M. olivacea Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 143, *Mamestra.*
1875. Grt., Can. Ent., VII, 27, *Mamestra.*
1877. Grt., Bull. Geol. Surv., III, 797, *Mamestra.*
1887. Smith, Proc. U. S. Nat. Mus., X, 465, *Mamestra.*
comis Grt.
1877. Grt., Bull. Geol. Surv., III, 85, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 254, pr. syn.
var. **obscurior** Smith.
1887. Smith, Proc. U. S. Nat. Mus., X, 465, *Mamestra.*

HABITAT.—Atlantic to Pacific through northern and middle United States; Colorado; July, August, September.

I do not know where the type of *olivacea* is. The type of *comis* is in the Edwards collection; that of *obscurior* is with Mrs. Fernald.

M. rectilinea Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 465, *Mamestra.*

HABITAT.—New York; Colorado; California; Oregon; Vancouver.

The types are in the National Museum.

M. vau-media Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 466, *Mamestra.*

HABITAT.—Colorado.

The type is with Mr. J. Doll.

M. incurva Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 466, *Mamestra.*

HABITAT.—Colorado; Arizona; New Mexico.

The type is in Mr. Neumœgen's collection.

M. 4-lineata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 140, pl. 4, f. 15, *Mamestra.*

HABITAT.—Arizona; California, February, March, April, June, August, October.

Types are in the British Museum and in the Edwards collection.

M. marinitincta Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., ii, 273, *Mamestra.*
1877. Harv., Bull. Buff. Soc. Nat. Sci., iii, 6, *Mamestra.*

HABITAT.—Texas, October, November.

The type is in the British Museum and is the same species received by the National Museum from Belfrage under that name.

M. laudabilis Gn.*

1852. Gn., Spec. Gen., Noct., ii, 30, pl. 8, f. 4, *Hecatera.*
1857. Wlk., C. B. Mus., Het., xi, 511, *Hecatera.*
1874. Grt., Proc. Bost. Soc. N. H., xvi, 241, *Mamestra.*
1875. Grt., Can. Ent., vii, 27, *Mamestra.*
indicans Wlk.
1856. Wlk., C. B. Mus., Het., x, 359, *Hapalia.*
1868. G. & R., Trans. Am. Ent. Soc., ii, 78, pr. syn.
strigicollis Wallgr.
1860. Wallgr., Wien. Ent. Monatschr., iv, 170, *Hecatera.*
1891. Smith, Proc. U. S. Nat. Mus., xiv, 274, *Mamestra.*
var. **illaudabilis** Grt.*
1875. Grt., Can. Ent., vii, 27, *Mamestra.*
1881. Grt., Can. Ent., xiii, 129, *Mamestra.*

HABITAT.—New Jersey; southward and westward to Florida, Texas, and Colorado; California, April, August, September; Colorado in August.

Types of the Guenée, Grote, and Walker species are in the British Museum. I think there can be no reasonable doubt that Wallengren's species is the same.

M. alboguttata Grt.*

1877. Grt., Bull. Buff. Soc. Nat. Sci., iii, 85, *Mamestra.*

HABITAT.—New Mexico; Oregon; California.

The type is in the British Museum.

M. cuneata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 139, pl. 4, f. 9, *Mamestra.*
1874. Grt., Can. Ent., VI, 156, *Mamestra.*

HABITAT.—California; Washington; Oregon, May and June; Vancouver; New York.

The type is in the British Museum.

M. sutrina Grt.

1881. Grt., Papilio, I, 5, *Mamestra.*

HABITAT.—Colorado.

The type is in the British Museum. This species was unknown to me when I wrote my revision of *Mamestra.* It resembles *lustralis* more than it does *cuneata;* but the male antennæ are simple. In its position next to *cuneata* its resemblance to *lustralis* will serve to differentiate it.

M. lorea Gn.*

1852. Gn., Spec. Gen., Noct., I, 126, *Hydrœcia.*
1887. Wlk., C. B. Mus., Het., IX, 161, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 13, *Mamestra.*
1879. Grt., Can. Ent., XI, 28, ? *Graphiphora.*
ligata Wlk.
1860. Wlk., Can. Nat. & Geol., V, 253, *Hydrœcia.*
1877. Grt., Can. Ent., IX, 28, pr. syn.
dodgei Grt.
1875. Grt., Can. Ent., VII, 90, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 262, pr. syn.

HABITAT.—Canada; Eastern, Middle, and Central States to Nebraska, Colorado; June, July, August, September.

The type of *lorea* is in the British Museum. I have seen the type of *dodgei* in the Tepper collection. The type of *ligata* is in the collection of the Entomological Society of Ontario.

M. quadrannulata Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 430, *Mamestra.*

HABITAT.—Nebraska; Texas; Colorado.

The type is in the Tepper collection. A correctly determined specimen is in the British Museum.

M. erecta Wlk.*

1856. Wlk., C. B. Mus., Het., X, 264, *Celæna.*
1891. Butler, Entomologist, XXIV, 241, *Hecatera.*
constipata Wlk.
1857. Wlk., C. B. Mus., Het., IX, 743, ? *Perigea.*
1891. Butler, Entomologist, XXIV, 241, pr. syn.
innexa Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 123, *Perigrapha.*

1874. Morr., Proc. Bost. Soc. N. H., xvii. 214. *Mamestra.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii. 309. *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., xiv. 263. pr. syn.

HABITAT.—Texas: "East Florida." March, April.

The types of all the names are in the British Museum. The locality "East Florida," is rather dubious, for I have not known of any save Texan species heretofore.

M. longiclava Smith.

1891. Smith, Proc. U. S. Nat. Mus., xiv, 265. *Mamestra.*

HABITAT.—Colorado.

The type is with Mr. Neumœgen.

M. anguina Grt.*

1881. Grt., Can. Ent., xiii, 129, *Mamestra.*

HABITAT.—Maine: New Jersey; Illinois; Nebraska; Colorado.

The type is in the British Museum.

M. vicina Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii. 156. *Mamestra.*
1877. Grt., Can. Ent., ix, 197, *Mamestra.*
teligera Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii. 215. *Mamestra.*
1877. Grt., Can. Ent., ix. 197. ? pr. syn.
1881. Grt., Can. Ent., xiii, 129, pr. syn.
acutipennis Grt.
1882. Grt., Can. Ent., xii. 214. *Mamestra.*
1883. Grt., Can. Ent., xiii. 129. *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., xiv. 267. pr. syn

HABITAT.—Maine to Texas, to California: June to October.

The types of *vicina* and *acutipennis* are in the British Museum; that of *teligera* is in the Museum of Comparative Zoölogy at Cambridge. The type of *acutipennis* is somewhat more than usually powdery; but else I find no difference from *vicina*. The specimen is badly set, giving the wings a peculiarly pointed appearance, which apparently suggested Mr. Grote's name.

M. pensilis Grt.*

1874. Grt., Proc. Acad. Nat Sci. Phil., 1874, 199, *Dianthœcia.*
1874. Grt., Can. Ent., vi, 215, *Dianthœcia.*
1881. Grt., Can. Ent., viii, 128, *Mamestra.*

HABITAT.—Texas; Colorado; California; Washington; Vancouver, August, September, October, November.

M. ferrealis Grt.

1883. Grt., Can. Ent., xv, 29, *Mamestra.*

HABITAT.—Montana.

I have no idea where the type of this species could be found, and have not recognized it as yet.

M. impolita Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 140, *Mamestra*.

HABITAT.—Quebec, Canada.

The species is unknown to me. It came from Prof. F. X. Belanger, Université Laval, and he may have the type.

M. subdita Mœschl.

1860. Mœschl., Wien. Ent. Monatschr., IV, 363, pl. 9, f. 7, *Dianthœcia*.
1864. Mœschl., Wien. Ent. Monatschr., VIII, 197, pl. 5, f. 15, *Dianthœcia*.
1881. Grt., Can. Ent., XIII, 130, *Mamestra*.

HABITAT—Labrador.

I have seen the type. It is not really typical *Mamestra*; but I have no satisfactory place for it at present and leave it where it will be most naturally sought for.

Genus SCOTOGRAMMA Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 469.

A revision of the species of this genus, with descriptions of each, will be found in the Proc. U. S. Nat. Mus., XII, 461, 1889.

S. submarina Grt.*

1883. Grt., Can. Ent., XV, 4, *Anarta*.
1887. Smith, Proc. U. S. Nat. Mus., x, 469, *Scotogramma*.

HABITAT.—Arizona; Montana; Oregon.

The type is with Mr. Neumoegen.

S. phoca Moeschl.

1864. Moeschl., Wien. Ent. Monatschr., VIII, 197, pl. 5, f. 15, *Dianthœcia*.
1881. Grt., Can. Ent., XIII, 130, *Mamestra*.
1887. Smith, Proc. U. S. Nat. Mus., x, 469, *Scotogramma*.
promulsa Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 97, *Mamestra*.
1875. Grt., Can. Ent., VII, 22, *Anarta*.
1876. Grt., Stett. Ent. Zeit., XXXVII, 135, *Anarta*.
1881. Grt. Can. Ent., XIII, 127, *Anarta*.
1882. Smith, Bull. Bkln. Ent. Soc., V, 68, *Mamestra*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 463, pr. syn.

HABITAT.—Labrador; Colorado in July and August.

Mr. Morrison's type is in the Tepper collection. Mr. Moeschler had the kindness to send me a typical specimen some years ago, which enabled me to make the comparisons resulting in the above synonymy. Material is very scant in most of the species of this genus.

S. perplexa Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 469, *Scotogramma*.

HABITAT.—Colorado.

The type is in the Tepper collection.

S. inconcinna Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 469, *Scotogramma.*

HABITAT.—Colorado.

The type is in the National Museum.

S. umbrosa Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 470, *Scotogramma.*

HABITAT.—Arizona; Colorado.

Types are in the National Museum.

S. stretchii Hy. Edw.

1887. Hy. Edw., Can. Ent., XIX, 146, *Scotogramma.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 464, *Scotogramma.*

HABITAT.—Colorado Desert.

The type is in the Edwards collection.

Genus **ULOLONCHE** Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 471.

A monographic treatment of the species will be found in the Proc. U. S. Nat. Mus., 1889, Vol. XII, 465. This paper is cited only to authenticate synonymy or generic reference.

U. niveiguttata Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 140, pl. 4, f. 16, *Mamestra.*
1887. Smith, Proc. U. S. Nat. Mus., x, 471, *Ulolonche.*

HABITAT.—California; Arizona.

The types are in the British Museum and in the Edwards collection.

U. fasciata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 471, *Ulolonche.*

HABITAT.—New Mexico.

The type is in the National Museum.

U. disticha Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 217, *Caradrina.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 310, *Orthosia.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 37, *Orthosia.*
1891. Smith, List Lepidoptera, 42, *Ulolonche.*

HABITAT.—Colorado in June; Texas.

The type is in the Museum at Cambridge; another specimen, also marked "type," is in the British Museum. The species has distinctly hairy eyes and is as little an *Orthosia* as it is a *Caradrina.*

U. modesta Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 114, *Dianthœcia.*
1879. Grt., Can. Ent., XI, 27, *Graphiphora.*

1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*
1887. Smith, Proc. U. S. Nat. Mus., X, 471, *Ulolonche.*

HABITAT.—Canada; New England, Middle, and Central States, May, June, and July.

I have seen no specimens marked "type."

U. orbiculata Smith.*

1891. Smith, Proc. U. S. Nat. Mus., XIV, 266, *Mamestra.*

HABITAT.—Colorado.

The type is in the National Museum.

Genus **HADENA** Schrank.

1804. Schrank, Fauna Boica, II, 2, 158.

This genus will probably stand subdivision into several genera. Two rather well-marked groups, or subgenera, *Xylophasia* and *Luperina*, have been monographed by me in the Proc. U. S. Nat. Mus., 1890, Vol. XIII, pp. 407–447, and this paper is not cited save when necessary to authenticate a change. It is likely that, eventually, both of these subdivisions will take generic rank, and the term *Hadena* will probably be restricted to one of them. The species not included in the above revision are for the present placed into a section *Hadena* merely to separate them. As usual, unless otherwise stated, my identification of the species was correct.

§ **LUPERINA** Bdv.

1829. Bdv., Index Methodicus.

L. niveivenosa Grt.*

1879. Grt., Bull. Geol. Surv., V, 206. *Agrotis.*
1890. Smith, Proc. U. S. Nat. Mus., XIII, 410, *Luperina.*

HABITAT.—Montana; Colorado.

The type is with Mr. Graef, and a considerable number of specimens indicate quite a variable species. Curiously enough I have never seen a male.

L. stipata Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 64, *Hadena.*

HABITAT.—Illinois; Massachusetts; Maine; Minnesota; Wisconsin; Colorado.

The type is in the Tepper collection.

L. passer Gn.*

1852. Gn., Spec. Gen., Noct., I, 195, *Mamestra.*
1856. Wlk., C. B. Mus., Het., IX, 231, *Mamestra.*
1879. Grt., Can. Ent., XI, 179. *Hadena.*
1882. Grt., New List, 27, *Luceria.*
incallida Wlk.
1856. Wlk., C. B. Mus., Het., X, 330, *Agrotis.*

1869. G. & R., Trans. Am. Ent. Soc., II, 78 = *Agrotis venerabilis.*
1889. Butler, Trans. Ent. Soc. Lond., 1889, 377 = *Agrotis venerabilis.*
loculata Morr.
1874. Morr., Bull. Buff. Soc. N. H., II, 110, *Luceria.*
1879. Grt., Can. Ent., XI, 179, pr. syn.
viralis Grt.
1880. Grt., Bull. Geol. Surv., VI, 260, *Agrotis.*
1890. Smith, Bull. U. S. Nat. Mus., No. 38, 207, *Agrotis.*
var. **conspicua** Morr.
1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 110, *Luceria.*

HABITAT.—Canada, June and July; Massachusetts, June and July; Connecticut; New York, July, August, and September; Illinois, October; Colorado; Oregon.

The types of *passer*, *incallida*, and *viralis* are in the British Museum; those of *loculata* and *conspicua* are in the Tepper collection; a specimen of *loculata* also marked "type" is in the British Museum. Mr. Walker's type is a badly rubbed specimen, undoubtedly the same as *passer*. I can not understand how both Mr. Grote and Mr. Butler could see any resemblance to *venerabilis*, and at all events the structural characters should have prevented the reference. Mr. Grote's type of *viralis* is a badly faded and discolored specimen, also without doubt the same as *passer*. In the Cambridge Museum is a specimen of this same species marked "*Hadena destructor* Peck," in Mr. Grote's handwriting.

L. **burgessi** Morr.

1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 109, *Luceria.*
1875. Grt., Check List, Noct., *Hadena.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 36, *Hadena.*
1882. Grt., New List, 27, *Luceria.*
discors Grt.
1881. Grt., Trans. Kans. Ac. Sci., VII, 65, *Hadena.*
1890. Smith, Proc. U. S. Nat. Mus., XIII, 412, pr. syn.

HABITAT.—Massachusetts; Arizona; Nebraska.

The type of Mr. Morrison's species is in Mr. Tepper's collection.

L. **longula** Grt.*

1879. Grt., Bull. Geol. Surv., V, 204, *Hadena.*

HABITAT.—New Mexico; Colorado; Nevada; Kansas; Washington.

Mr. Grote's type is in the British Museum.

§ XYLOPHASIA Steph.

1829. Steph., Ill. Br. Ent., Haust., II, 174.

X. **remissa** Hbn.*

1812. Hbn., Samml. Eur. Schmett., Noct., 423, *Noctua.*
1816. Hbn., Verzeichniss, 219, *Astrapetis.*
1852. Gn., Spec. Gen., Noct., I, 208, an var. *gemina.*
indocilis Wlk.
1856. Wlk., C. B. Mus., Het., IX, 178, *Xylophasia.*

1882. Grt., Ill. Essay, 44, pr. syn.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 386, pr. syn.

HABITAT.—Middle and Eastern States; North Carolina; New York in June.

Walker's type is in the British Museum, and is this species of Hübner's.

X. separans Grt.

1880. Grt., Bull. U. S. Geol. Surv., VI, 260, *Hadena*.
1890. Smith, Proc. U. S. Nat. Mus., XIII, 425 = *ducta*.

HABITAT.—New York in June and July; Wisconsin.

The type is in the British Museum. I find I had entirely mistaken this species. It has nothing to do at all with *ducta* nor with the *devastatrix* group, in fact, but belongs with the *vultuosa* series. It is a very close ally in maculation to *remissa*, or yet nearer to the European *gemina*, but much darker and with all the pale markings wanting. The W-mark in the s. t. line is distinct, the orbicular oblique, and there is a broad dash between the ordinary lines. I can not at present remember where I obtained the specimens marked *separans*, which led to my erroneous reference.

X. suffusca Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 61, *Hadena*.
1877. Grt., Can. Ent., IX, 29 = *Agrotis illata*.
illata ‡ Grt.
1876. Grt., Can. Ent., VIII, 29, *Hadena*.
1877. Grt., Can. Ent., IX, 29, *Hadena*.

HABITAT.—Canada to Texas; Colorado, August; New York, May, June, July, September; Massachusetts in August.

Mr. Grote has referred this species, the type of which is in the Tepper collection, to *illata* Wlk.; but that species is really an *Agrotid*, as described by Mr. Walker, and is the *cinereomaculata* form of *turris*. There is a vague sort of resemblance between the species, but an examination of the generic characters should have prevented the reference.

X. apamiformis Gn.*

1852. Gn., Spec. Gen., Noct., I, 137, *Xylophasia*.
1856. Wlk., C. B. Mus., Het., IX, 176, *Xylophasia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 109, *Hadena*.
contenta Wlk.
1857. Wlk., C. B. Mus., Het., XI, 754, *Hadena*.
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.

HABITAT.—Canada, June and August; New York, June, July, and August; New Jersey; Pennsylvania; Illinois; Colorado; District of Columbia, in June.

Both the Guenée and the Walker types are in the British Museum.

X. vultuosa Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 420, *Hadena.*

HABITAT.—Canada; Northern, Eastern, Middle, and Central States; New York in May and June; Massachusetts in August.

The type is in the British Museum.

X. exornata Moeschl.

1864. Moeschl., Wien. Ent. Monatschr., iv, 364, pl. 9, f. 5, *Hadena.*
1867. Pack., Proc. Bost. Soc. N. H., xi, 39, *Hadena.*

HABITAT.—Labrador; Colorado, Glenwood Springs, August.

I have seen a typical specimen from Mr. Moeschler. In the British Museum there are two specimens erroneously named; but one from the Grote collection is correctly determined.

H. morna Strk.*

1879. Strk., Rept. Chief Eng., 1878–'79, v. v, p. 1861, *Hadena.*
1890. Smith, Proc. U. S. Nat. Mus., xiii, 422, *Xylophasia.*

HABITAT.—"Rio Blanco"; Colorado.

The type is in Mr. Strecker's collection.

I have identified this species in Mr. Bruce's material, and find its best position here.

X. hulstii Grt.*

1880. Grt., No. Am. Ent., i, 93, *Hadena.*

HABITAT.—Colorado.

The type is in the Graef collection. Mr. Bruce has, during 1891, taken the species in small numbers.

X. finitima Gn.*

1852. Gn., Spec. Gen., Noct., i, 206, *Apamea.*
1856. Wlk., C. B. Mus., Het., ix, 250, *Apamea.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 150, an var. *basilinea.*
1878. Graef, Bull. Bkln. Ent. Soc., i, 9, an var. *basilinea.*
1882. Grt., New List, 1882, 27, *Hadena.*

HABITAT.—Canada; Northern, Middle, and Eastern States in May and June; Colorado; Oregon, May.

The type is in the British Museum.

X. lateritia Hfn.*

1767. Hfn., Berlin. Mag., iii, 306, *Noctua.*
1776. Rott., Naturf., ix, 127, *Noctua.*
1816. Hbn., Verzeichniss, 243, *Septis.*
1852. Gn., Spec. Gen., Noct., i, 137, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., ix, 170, *Xylophasia.*
1874. Grt., Can. Ent., vi, 215, *Hadena.*
molochina Hbn.
1812. Hbn., Samml. Ex. Schmett. Noct., 74, *Noctua.*

1816. Hbn., Verzeichniss, 243, pr. syn.
obliviosa Wlk.
1858. Wlk., C. B. Mus., Het., xv, 1683, *Mamestra.*
1891. Smith, Proc. U. S. Nat. Mus., xiv, *Mamestra.*

HABITAT.—Europe; United States; Canada in July; New York, July and August; Colorado, October.

Walker's type is in the British Museum, and is what we know as *lateritia*. On the other hand, both *insignata* and *dubitans* Wlk., do not agree with *lateritia*, but are exactly the same as Mr. Grote's *sputatrix*. *Insignata* has been referred to both species at different times by Mr. Grote.

X. cogitata Smith.*

1890. Smith, Proc. U. S. Nat. Mus., xiii, 421, *Xylophasia.*
insignata || Wlk.
1860. Wlk., Can. Nat. and Geol., v, 254, *Apamea.*

HABITAT.—Sierra Nevada, California; Colorado, Manitou in June and September; Canada, in July; New Hampshire.

Types are in the National Museum, at Rutgers College and in the Neumœgen collection. The type of Walker's *insignata* described in the Can. Nat. and Geol., I owe to the courtesy of Mr. Moffat, curator for the Entomological Society of Ontario. It is a very poor specimen, but undoubtedly the species described by me. Fortunately Walker had preoccupied the name in 1857 for a closely allied species.

X. dubitans Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 232, *Mamestra.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 108, *Hadena.*
1874. Grt., Can. Ent., vi, 215 = *lateritia.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 146, an var. *lateritia.*
insignata Wlk.
1857. Wlk., C. B. Mus., Het., xi, 729, *Apamea.*
1868. G. & R., Trans. Am. Ent. Soc., ii, 78=*lateritia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 108=*lateritia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 190, n. b. l.
sputatrix Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 190, *Hadena sputator.*
1875. Grt., Check List Noct., 9, *Hadena sputatrix.*

HABITAT.—Canada; Eastern, Northern, Central, and Middle States, July, August, September.

The types of all the names are in the British Museum, and the type of *dubitans* is undoubtedly the same as *sputatrix* and not like *lateritia*. The question of whether this *insignata* should be considered a *nomen bis lectum* need not be decided under the circumstances.

X. plutonia Grt.

1883. Grt., Can. Ent., xv, 9, *Hadena.*

HABITAT.—Maine; Wisconsin.

The type is in Dr. Thaxter's collection. The *plutonia* of the British Museum collection is an *Agrotis pastoralis*.

X. alticola Smith.

1890. Grt., Proc. U. S. Nat. Mus., XIII, 423, *Xylophasia*.

HABITAT.—Gibson Mountains, Colorado, 12,500 feet.

The type is in the National Museum.

X. ducta Grt.*

1878. Grt., Bull. Geol. Surv., IV, 176, *Hadena*.

HABITAT.—Maine; Canada; New York; Washington.

The type is in the British Museum, and is the species I know as such. Dr. Bethune sent me a specimen marked *insulsa* by Walker; but the type of *insulsa* is *Carneades campestris*.

X. impulsa Gn.*

1852. Gn., Spec. Gen., Noct., I, 194, *Mamestra*.
1856. Wlk., C. B. Mus., Het., IX, 231, *Mamestra*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 108, *Hadena*.
var. **mixta** Grt.
1880. Grt., Bull. Geol. Surv., VI, 264, *Hadena*.

HABITAT.—Canada in July and August. Eastern and Middle States June and July; Texas.

Mr. Grote's types are in the British Museum. The variety *mixta* has the reniform somewhat pale marked, and the specimen is a little rubbed so as to show a yellowish ground. Else it does not differ from the type form.

X. devastatrix Brace.*

1819. Brace, Am. Journ. Sci., I, 154, *Phalæna*.
1856. Fitch, Rept. Ins., N. Y., 315, pl. 3, f. 2, *Agrotis*.
1862. Harris, Inj. Ins., Flint ed., 445, *Agrotis*.
1869. Riley, 1st Rept. Ins. Mo., 83, *Agrotis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 108, *Hadena*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 147, *Hadena*.
1878. Grt., Bull. Geol. Surv., IV, 178, *Hadena*.
1881. Riley, Index and Supplt. to Mo. Repts., 56, *Hadena*.
1883. Saund., Fruit Insects, 329, f. 341, 342, *Hadena*.
abjecta var. ‡ Gn.
1852. Gn., Spec. Gen., Noct., I, 194, *Mamestra*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 147, *Hadena*.
ordinaria Wlk.
1856. Wlk., C. B. Mus., Het., IX, 232, *Mamestra*.
1868. G. and R., Trans. Am. Ent. Soc., II, 77, pr. syn.
1882. Grt., Ill. Essay, 43, pr. syn.
contenta Wlk.
1856. Wlk., C. B. Mus., Het., IX, 233, *Mamestra*.
1882. Grt., Ill. Essay, 43, pr. syn.
marshallana Westw.
1857. Humph., British Moths, I, 122, *Agrotis*.
1858. Wlk., C. B. Mus., Het., XIV, 1698 = *contenta*.

HABITAT.—United States and Canada, June to September.

Walker's types are in the British Museum and have been referred by Mr. Grote. The reference to *marshallana* is aft

The economic literature of the species is large, and is given in great part by Mr. Edwards in his catalogue of early stages.

X. exulis Lef.*

1836. Lef., Ann. Soc. Ent. Fr., v, 393, pl. 10, f. 2, *Hadena*.
1852. Gn., Spec. Gen., Noct., i, 185, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 220, *Crymodes*.
gelata Lef.
1836. Lef., Ann. Soc. Ent. Fr., v, 393, pl. 10, f. 3, *Hadena*.
1852. Gn., Spec. Gen., Noct., i, 185, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 220, *Crymodes*.
grœnlandica Zett.
1839. Zett., Ins. Lapp., 939, *Hadena*.
1845. H. Sch., Schmett. Eur., ii, 274, 284, pl. 31, *Polia*.
1852. Gn., Spec. Gen., Noct., i, 185, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 219, *Crymodes*.
marmorata Zett.
1839. Zett., Ins. Lapp., 937, *Hadena*.
1845. H. Sch., Schmett. Eur., ii, pl. 451, *Polia*.
1856. Wlk., C. B. Mus., Het., ix, 220 = *poli*.
diffua Geyer.
1837. Geyer, Zutr. Hbn. Samml. Ex., 9, ff., 821, 822, *Exarnis*.
1871. Staud., Cat. Lep., 100 = *exulis*.
1881. Grt., Can. Ent., xiii, 91, = *exulis*.
gelida Gn.
1852. Gn., Spec. Gen., Noct., i, 186, pl. iv, f. 7, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 221, *Crymodes*.
poli Gn.
1852. Gn., Spec. Gen., Noct., i, 187, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 220, *Crymodes*.
borea Gn.
1852. Gn., Spec. Gen., Noct., i, 186, *Crymodes*.

HABITAT.—Labrador; Greenland; Iceland.

The synonymy is from Staudinger in great part, and his catalogue should be consulted for references to European literature. In the Jardin des Plantes at Paris is a long series of specimens separated out by Guenée and containing types of his names. They all refer to one species.

X. sommeri Lef.

1836. Lef., Ann. Soc. Ent. Fr., iii, 391, pl. 10, f. 1, *Hadena*.
1852. Gn., Spec. Gen., Noct., i, 187, *Crymodes*.
1856. Wlk., C. B. Mus., Het., ix, 220, *Crymodes*.

HABITAT.—Labrador; Greenland; Iceland.

Mr. Mœschler kindly sent me a specimen for study years ago, and I have seen none since.

X. arctica Bdv.*

1840. Bdv., Gen. et Ind. Meth., 120, *Hadena*.
Sch., Schmett. Eur., ii, 272, pl. 31, f. 155, *Polia*.
Gen. Noct., i, 193, *Mamestra*.
5. *Mamestra*.

1870. Saund., Can. Ent., ii, 75, *Mamestra*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 14, *Hadena*.
amputatrix Fitch.
1856. Fitch, 3d Rept. Ins. N. Y., 425, *Hadena*.
1869. Riley, 1st Rept. Ins. Mo., 87, *Hadena*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 108, pr. syn.
amica ‡ Harr.
1862. Harr., Inj. Ins., Flint ed., 450, f. 222, *Hadena*.
1873. Grt., Proc. Bost. Soc. N. H., xvi, 241, pr. syn.

HABITAT.—United States east of the Rocky Mountains; New Mexico; Colorado, June to September.

X. albina Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 157, *Hadena*.
1881. Grt., Bull. U. S. Geol. Surv., vi, 263, an var. *castanea*.

HABITAT.—California.

The "type" is in the British Museum; but I am not sure it is a fair representative of the species Mr. Grote meant to describe. It seems to be really a form of *castanea*, as Mr. Grote suggested; but the specimen in the Tepper collections, also marked "type" by Mr. Grote, is more nearly allied to *arctica*, and is a good species as shown in my Revision. I prefer still to consider the form described by me as the species intended by Mr. Grote, the more so as I could not by comparison of the sexual characters of the British Museum "type" decide the question positively.

X. pluviosa Wlk.

1865. Wlk., C. B. Mus., Het., xxxiii, 725, *Eurois*.
castanea Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 156, *Hadena*.
cymosa Grt.
1881. Grt., Papilio, i, 34, *Hadena*.
1881. Grt., Papilio, i, 59 = *castanea*.
1881. Grt., Bull. Geol. Surv., vi, 263 = *castanea*.

HABITAT.—California in April and May; Washington; Vancouver.

The types of all the names are in the British Museum. Mr. Walker's *pluviosa* is exactly like *castanea*. Another "type" of *castanea* is in the Tepper collection.

X. occidens Grt.*

1878. Grt., Bull. U. S. Geol. Surv., iv, 177, *Hadena*.

HABITAT.—Nevada; Colorado, August; Sierra Nevada, California.

The type is in the British Museum.

X. perpensa Grt.

1883. Grt., Can. Ent., xiii, 229, *Hadena*.

HABITAT.—Arizona; New Mexico.

The type is in Mr. Neumœgen's collection.

X. cuculliformis Grt.

1875. Grt., Check List Noct., 24, *Hadena.*

HABITAT.—California.

The type is in the British Museum.

X. verbascoides Gn.*

1852. Gn., Spec. Gen., Noct., I, 141, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., IX, 177, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 109, *Hadena.*

HABITAT.—Middle, Eastern, and Central States, June and July.

The type is in the British Museum.

X. nigrior Smith.

1890. Smith, Proc. U. S. Nat. Mus., XIII, 437, *Xylophasia.*

HABITAT.—Maine.

The type is with Dr. Thaxter.

X. cariosa Gn.*

1852. Gn., Spec. Gen., Noct., I, 144, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., IX, 178, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 109, *Hadena.*
1874. Grt., Can. Ent., VI, 15, *Hadena.*
idonea Grt.
1882. Grt., Can. Ent., XIV, 18, *Hadena.*
1890. Smith, Proc. U. S. Nat. Mus., XIII, 438, *Xylophasia.*

HABITAT.—Maine to Texas; Wisconsin; Arizona; Northern States, June and July.

The types of both names are in the British Museum, and are undoubtedly the same species, much to my surprise. The *cariosa* type is a dark form of what I have always labeled with the same name; but the *cariosa* of the Grote collection is what I have supposed was *idonea.* I am the more surprised at this as my original knowledge of Guenée's species was based upon specimens labeled by Mr. Grote. I had supposed *idonea* to be the western representative of *cariosa.* I find now that there are probably two species covering the same range. Mr. Grote seems to have realized the same fact; but in separating them he unfortunately selected as type exactly the same form described by Guenée. The matter needs further study. I had no males of "*idonea*" before me when I wrote, and therefore can not be sure that the characters given by me authorize a new specific name.

X. vulgaris G. & R.*

1863. G. & R., Proc. Ent. Soc. Phila., VI, 19, pl. 3, f. 2, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 110, *Hadena.*
1874. Grt., 6th Rept. Peab. Ac. Sci., 32,=*Xylina socia.*

HABITAT.—Middle and Eastern States; District of Columbia, May, June, and July.

A specimen marked "type," by Mr. Grote, is in the British Museum.

X. cristata Grt.

1878. Grt., Bull. Geol. Surv., IV, 176, *Hadena.*

HABITAT.—Buffalo, New York.

The type is in the British Museum. It is a *vulgaris* of large size and with a reddish-yellow suffusion. It may be a good species, but is more probably an aberration. It will need a large material from the locality to decide.

X. antennata Smith.*

1890. Smith, Proc. U. S. Nat. Mus., XIII, 439, *Xylophasia.*

HABITAT.—California.

The type is in the National Museum.

X. relecina Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 216, *Hadena.*
1882. Grt., New List, 27, *Luceria.*

HABITAT.—Texas; Glenwood Springs, Colorado, in October.

The type is in the Museum of Comparative Zoölogy at Cambridge.

X. cinefacta Grt.

1881. Grt., Papilio, I, 77, *Hadena.*

HABITAT.—Washington; California; Colorado.

The types are in the British Museum and in the Edwards collection.

X. centralis Smith.*

1890. Smith, Proc. U. S. Nat. Mus., XIII, 441, *Xylophasia.*

HABITAT.—Sierra Nevada, California.

Types are in the National Museum and in the Edwards collection.

X. auranticolor Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 109, *Hadena.*

HABITAT.—Colorado; New Mexico; Washington, July 10, 8,000 feet; Oregon, May and June; Arizona; Nebraska, in August.

A specimen, not marked "type," is in the British Museum.

X. lignicolor Gn.

1852. Gn., Spec. Gen., Noct., I, 140, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., IX, 176, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 109, *Hadena.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 119, *Hadena.*
1879. Strk., Rept. Chief Eng., 1878–79, V, 1861, *Hadena.*
var. **quæsita** Grt.
1876. Grt., Can. Ent., VIII, 26, *Hadena.*
1877. Grt., Can. Ent., IX, 197, pr. syn.

HABITAT.—Canada; Northern, Eastern, Middle, and Western States; Arizona; Colorado; Northern and Middle States, June, July, August.

The types of both species and variety are in the British Museum.

X. genialis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 66, *Hadena.*

HABITAT.—California.

The type is in the British Museum.

X. inordinata Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 63, *Hadena.*
var. **montana** Smith.
1890. Smith, Proc. U. S. Nat. Mus., XIII, 444, *Xylophasia.*

HABITAT.—Massachusetts, in June; Maine; Colorado.

Mr. Morrison's type is in the Tepper collection, and is from the east; my type is in the National Museum, and is from Colorado..

X. semilunata Grt.*

1881. Grt., Papilio, I, 58, *Hadena.*

HABITAT.—Washington; Colorado.

The type is in the British Museum.

§ **HADENA** Schrank.

The groupings are only approximate, and the sequence of species is very defective.

H. evelina French.*

1888. French, Can. Ent., XX, 71, *Hadena.*

HABITAT.—California, Truckee, Shasta County, Sierra Nevada, in September; Glenwood Springs, Colorado, October.

The type is with Prof. French, who has kindly sent me a duplicate.

H. bridghami G. & R.*

1866. G. & R., Proc. Ent. Soc. Phil., VI, 17, pl. 3, f. 1, *Mamestra.*
1873. Grt., Bull. Buff. Nat. Sci., I, 108, *Hadena.*

HABITAT.—Eastern States; Massachusetts, in July.

A specimen labeled by Mr. Grote, but apparently not the type, is in the British Museum. I have no idea where the type is; but as the species is so very distinct and generally known, it is not a matter of serious importance.

H. transfrons Neum.

1883. Neum., Papilio, III, 139, *Hadena.*

HABITAT.—British Columbia.

The type is in Mr. Neumœgen's collection.

H. violacea Grt.

1881. Grt., Bull. Geol. Surv., VI, 261, *Hadena.*

HABITAT.—California, Shasta County, Sierra Nevada; Colorado, in October.

The types are in the British Museum and in the Edwards collection.

H. leucoscelis Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 26, *Polia.*
1875. Grt., Check List Noct., 9, *Hadena.*
fibulata Morr.
1874. Morr., Bull. Buff. Soc. Nat. Sci., ii, 112, *Dryobota.*
1875. Morr., Can. Ent., vii, 216, *Hadena.*
1875. Grt., Check List Noct., 9, pr. syn.
1880. Grt., Bull. Geol. Surv., vi, 265, pr. syn.

HABITAT.—Canada; Maine; Massachusetts, in July; Northern New York, in August; Wisconsin; Colorado.

Mr. Grote's type is in the British Museum. I have seen Mr. Morrison's type in some collection, and it is this species.

H. claudens Wlk.*

1857. Wlk., C. B. Mus., Het., xi, 753, *Hadena.*
hillii Grt.
1876. Grt., Ann. Lyc. Nat. Hist. N. Y., xi, 305, *Hadena.*

HABITAT.—New Foundland; Northern and Eastern States; Lewis County, New York, July.

Walker's type is in the British Museum, in which is also a specimen of Mr. Grote's species. The two names refer to the same form; Mr. Grote's type is in the Hill collection.

H. adnixa Grt.

1880. Grt., Can. Ent., xii, 243, *Hadena.*

HABITAT.—Nevada.

Types are in the British Museum and in the Tepper collection.

H. paviæ Behr.*

1874. Behr, in Strk. Lep. Rhop. et Het., 94, *Tæniocampa.*
1881. Grt., Bull. Geol. Surv., vi, 266=*curvata.*

HABITAT.—California.

Types are in Dr. Strecker's collection. In the British Museum are two specimens received from Mr. Hy. Edwards and labeled by him *Dryobota paviæ* Behr. They look like an evenly colored *curvata*, without contrasts of color. I believe the species to be a good one, and have named it *inconspicua* in the National Museum and in Mr. Edwards's collection. The name has not been sanctioned by description; but it appears in my List of Lepidoptera, No. 2034.

H. binotata Wlk.*

1865. Wlk., C. B. Mus., Het., xxxii, 663, *Mamestra.*
1882. Grt., Ill. Essay, 43, *Hadena.*
curvata Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 157, *Hadena.*
1882. Grt., Ill. Essay, 43, pr. syn.
detersa Wlk.
extersa Wlk.
1865. Wlk., C. B. Mus., Het., xxxiii, 728, *Hadena*,

HABITAT.—California; Washington; Vancouver.

The types of all these names are in the British Museum, and all refer to the same species. I can find no description of *detersa* Wlk., and it is possible that this is a *lapsus calami* for *extersa.*

H. genetrix Grt.

1878. Grt., Can. Ent., x, 237, *Hadena.*

HABITAT.—Nevada; Colorado.

The type is in the British Museum, and resembles a powdery *binotata* with all the maculation obscure.

H. characta Grt.*

1880. Grt., Can. Ent., XII, 243, *Hadena.*
1881. Grt., Bull. Geol. Surv., VI, 261, *Hadena.*

HABITAT.—Nevada; Arizona.

The type is in the British Museum; another typical specimen is in the Tepper collection, whence the type was received.

H. fumosa Grt.*

1879. Grt., Bull. Geol. Surv., v, 205, *Hadena.*

HABITAT.—Colorado; Washington.

The type is in the British Museum. I have a specimen compared with it.

H. indirecta Grt.*

1875. Grt., Can. Ent., VII, 28, *Hadena.*

HABITAT.—Colorado; California; Utah; Washington; Vancouver; British Columbia.

The type is in the British Museum.

H. divesta Grt.*

1874. Grt., Can. Ent., VI, 215, *Hadena.*
1875. Grt., Can. Ent., VII, 28, *Hadena.*

HABITAT.—Colorado; California; Washington; Vancouver, August.

The type is in the British Museum.

H. tusa Grt.

1878. Grt., Bull. Geol. Surv., IV, 177, *Hadena.*

HABITAT.—California.

The type is in the British Museum. It is a somewhat peculiar, broad-winged species, with prominent tuftings, and has a vague resemblance to *Euplexia.* The hind angles of the primaries are retracted, the margins of secondaries even.

H. tonsa Grt.

1880. Grt., Can. Ent., XII, 214, *Hadena.*

HABITAT.—Nevada.

The type is in the British Museum. It is a small, frail species, of the size of *modiola,* of which it is an ally. It is much more powdery and more ashen gray.

H. semicana Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 675, *Miana.*
latireptana Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 791, ? *Erastria.*
modiola Grt.
1879. Grt., Bull. Geol. Surv., V, 204, *Hadena.*

Habitat.—Wisconsin; "North America"; Colorado.

The types of the Walker and Grote names are in the British Museum, and all refer to the same species. Mr. Grote first compared his species to *modica* and afterward placed it next to *fractilinea*, of which I placed it as a variety in my list. It resembles exactly that species with all the red taken out. I have separated it here tentatively and for convenience in giving the synonymy.

H. fractilinea Grt.*

1874. Grt., Can. Ent., VI, 15, *Hadena.*
vulvivaga Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 144, *Hadena.*

Habitat.—Canada, in August; New York, in August; Illinois; Vermont; Wisconsin; Nebraska; Colorada; New Mexico.

Mr. Morrison's type is in the Tepper collection. Mr. Grote's type I have not seen. It does not seem to be in the British Museum, but I may have overlooked it. I have, however, seen a number of specimens named by Mr. Grote, and there is no doubt that Mr. Morrison's species is the same.

H. misera Grt.*

1881. Grt., Bull. Geol. Surv., VI, 582, *Hadena.*

Habitat.—Illinois; New York, in August; Wisconsin.

The type is with Mr. Neumoegen.

H. egens Wlk.

1856. Wlk., C. B. Mus., Het., X, 263, *Celæna.*
1882. Grt., Ill. Essay, 45, *Celæna.*
1889. Butler, Trans. Ent. Soc. Lond., 386 = *Mamestra ferrea.*

Habitat.—Hudson Bay Territory; Colorado.

Mr. Butler is in error in referring this species to *Mamestra stricta* Wlk., = *ferrea* Grt. It is not a *Mamestra* at all, but a *Hadena*, and the type, though a poor specimen and badly rubbed, is like an insect I have had from Colorado, collected by Bruce. It is a good species.

H. minuscula Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 147, *Orthosia.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 425, *Parastichtis.*
1875. Grt., Can. Ent., VII, pl. I. f. 3, *Parastichtis.*
1875. Morr , Proc. Ac. Nat. Sci. Phil., 1875, 431, *Hadena.*

Habitat.—Canada, in September; Massachusetts, in August and September; Maine; New Hampshire.

The type is in the Tepper collection.

H. marina Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 67, *Hadena*.

HABITAT.—California.

The type is in the British Museum. It is a smaller, narrower winged form, but with all the maculation much as in *miseloides*.

H. miseloides Gn.*

1852. Gn., Sp. Gen., Noct., II, 89, *Hadena*.
1853. H. Sch., Ex. Schmett., 212, *Hadena*.
1857. Wlk., C. B. Mus., Het., XI, 582, *Hadena*.

HABITAT.—United States, east of the Rocky Mountains; New York, in July; District of Columbia, in August; Texas, May and September.

The type is in the British Museum.

H. chlorostigma Harv.

1876. Harv., Can. Ent., VIII, 53, *Hadena*.

HABITAT.—Texas, May 22; Illinois.

The type is in the British Museum. It is yet smaller than *marina*, the reniform green; orbicular small and round; the lines white marked.

H. smaragdina Neum.

1883. Neum., Papilio, III, 140, *Hadena*.

HABITAT.—Southwest Arizona.

The type is in the Neumœgen collection.

H. mactata Gn.*

1852. Gn., Spec. Gen., Noct., I, 207, *Apamea*.
1856. Wlk., C. B. Mus., Het., IX, 250, *Apamea*.
1874. Grt., Trans. Am. Ent. Soc., V, 91, *Hadena*.

HABITAT.—Canada, July, August, and September; Northern, Eastern, and Middle States, same dates; Colorado.

The type is in the British Museum.

H. turbulenta Hbn.*

1820. Hbn., Zuträge, pl. 15, ff. 67, 68, *Phosphila*.
1857. Wlk., C. B. Mus., Het., XIII, 1018, *Amphipyra*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 180, *Hadena*.
1888. Beutenmüller, Can. Ent., XX, 136, larva.
1892. Edw. and Elliott, Bull. Am. Mus., N. H., IV, 77, larval habits.
arcuata Wlk.
1857. Wlk., C. B. Mus., Het., XI, 718, *Xylophasia*.

HABITAT.—New York, southward; Delaware in May; Georgia; Florida; Middle States, August and September.

Walker's type in the British Museum is an unusually large specimen of Hübner's species.

H. modica Gn.*

1852. Gn., Spec. Gen., Noct., I, 207, *Apamea.*
1856. Wlk., C. B. Mus., Het., IX, 250, *Apamea.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 15, *Hadena.*
subcedens Wlk.
1856. Wlk., C. B. Mus., Het., X, 264, *Celæna.*
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.
1889. Butler, Trans. Ent. Soc. Lond., 1889, 386, pr. syn.

HABITAT.—Canada; Eastern, Middle, and Central States; July to September; Colorado.

Guenée's type is probably in the Oberthür collection. Walker's is of course, in the British Museum.

H. hausta Grt.

1882. Grt., Can. Ent., XIV, 217, *Hadena.*

HABITAT.—Kittery Point, Maine; Northern New York; New Mexico.

The type is in Dr. Thaxter's collection.

H. cylindrica Grt.*

1880. Grt., Can. Ent., XII, 214, *Hadena.*

HABITAT.—Nevada.

The type is in the British Museum. It is a fragile thing, with slight body and large wings. Mr. Butler has placed it under *Bryophila.* It is more like Mr. Grote's *Hadenella.*

H. patina Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 7, *Hadena.*

HABITAT.—Texas, March and April; District of Columbia, August and September.

The type is in the British Museum, and is like the specimens from the Belfrage collection in the National Museum.

H. diversicolor Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 132, *Demas.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 419, *Hadena.*
1876. Grt., Stett. Ent. Zeit., XXXVII, 136, *Hadena.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 37, *Hadena.*

HABITAT.—Massachusetts, August and September; New York; New Hampshire.

The type is in the Tepper collection; another specimen in the British Museum is also marked "type."

H. tortilis Grt.

1880. Grt., Bull. Bkln. Ent. Soc., III, 46, *Hadena.*

HABITAT.—Washington.

The type is in the Tepper collection.

H. chryselectra Grt.*

1880. Grt., Can. Ent., XII, 244, *Hadena.*

HABITAT.—Colorado.

The type is in the Neumœgen collection.

Genus **HILLIA** Grt.

1883. Grt., Proc. Am. Phil. Soc., XXI, 168.

H. crasis H. Sch.*

1845. H. Sch., Schmett. Eur., II, 361, Noct., pl. 28, f. 139, *Noctua.*
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Orthosia.*
1891. Butler, Entomologist, XXIV, 241, ?*Anomogyna.*
erdmani Moeschl.
1874. Moeschl., Stett. Ent. Zeit., XXXV, 158, *Agrotis.*
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, pr. syn.
semisigna Wlk.
1857. Wlk., C. B. Mus., Het., XI, 748, ? *Orthosia.*
1891. Butler, Entomologist, XXIV, 241, ? pr. syn.
senescens Grt.
1878. Grt., Can. Ent., X, 235, *Hadena.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 168, *Hillia.*
1891. Butler, Entomologist, IV, 241 = *semisigna.*
vigilans Grt.
1878. Grt., Bull. Geol. Surv., IV, 176, *Hadena.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 168, *Hillia.*

HABITAT.—Colorado; Lewis County, New York, in September; Orono, Maine; Ontario; Labrador; Lapland; Sweden.

I have seen the types of *vigilans*, *senescens*, and *semisigna* in the British Museum. Mr. Butler refers *semisigna* Wlk., to *senescens;* but in my notes I have referred it to *vigilans*, I think more correctly. The specimens of *crasis* in the museum left me in doubt as to the synonymy; but this doubt was removed by the specimens in the museum at Berlin. Mr. Moeschler long ago sent me a specimen of his *erdmani*, labeled =*crasis.* We have here a decidedly variable species, the gray form being *senescens* Grt., and the *crasis* of the Berlin Museum. The reddish form is *vigilans* Grt., and *erdmani* Moeschl., with *semisigna* Wlk., somewhat intermediate but nearer to *vigilans.* In maculation the median lines vary in distinctness and the ordinary spots in the amount of black surrounding them. The species is not common, and I think I have seen nearly all the specimens in the American collections.

H. algens Grt.*

1878. Grt., Can. Ent., X, 236, *Hadena.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 168, *Hillia.*

HABITAT.—Maine; northern New York; Colorado.

The type is in the British Museum. It is a poor specimen and Mr. Butler makes it a *Calathusasina*, placing it next to *Charadra*.

H. discinigra Wlk.

1856. Wlk., C. B. Mus., Het., IX, 27, *Bryophila*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 8, *Jaspidea*.
1882. Grt., Ill. Essay, 40, ? *Valeria*.

HABITAT.—Hudson Bay Territory.

The type in the British Museum is a poor, crushed female, closely allied to *algens*, but much darker basally. It is not impossible that it may prove a suffused form of Mr. Grote's species, but it will need more material than I have seen to decide. Mr. Butler places it in *Dicopis*, evidently without reference to the essential characters of that genus.

Genus **TRACHEA** Hbn.

1816. Hbn., Verzeichniss, 219.

T. delicata Grt.*

1874. Grt., Trans. Am. Ent. Soc., V, 92, *Hadena*.
1890. Grt., Revised Check List, 20, *Trachea*.
interna Grt.
1875. Grt., Check List, Noct., 24, *Hadena*.
1876. Grt., Can. Ent., VIII, 189, pr. syn.
1890. Grt., Revised Check List, 20, pr. var.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States.

The types are in the British Museum.

Genus **PSEUDANARTA** Hy. Edw.

1875. Proc. Cal. Ac. Sci., VI, 133.

A revision of the species of this genus will be found in the Entomologica Americana, V, 175, to which reference should be made for specific characters.

P. flava Grt.*

1874. Grt., Trans. Am. Ent. Soc., V, 91, *Hadena*.
1878. Grt., Bull. Geol. Surv., IV, 178, *Pseudanarta*.
crocea Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Nat. Sci., VI, 133, *Pseudanarta*.
1880. Grt., Bull. Geol. Surv., VI, 265, pr. var.
1881. Grt., Can. Ent., XII, 215, pr. var.
1889. Smith, Ent. Amer., V, 178, pr. syn.

HABITAT.—British Columbia; Oregon; Nevada; Colorado, August and September; Arizona.

Mr. Grote's type is in the British Museum; Mr. Edwards's species is in his own collection.

P. singula Grt.*

1880. Grt., Can. Ent., XII, 215, *Pseudanarta*.

HABITAT.—Texas, in October; Arizona; Colorado in August.

The type is in the British Museum.

P. flavidens Grt.*

1879. Grt., Bull. Geol. Surv., v, 205, *Pseudanarta.*

HABITAT.—Colorado in September; New Mexico.

The type is in the British Museum.

. **aurea** Grt.

1879. Grt., Bull. Geol. Surv., v, 205, *Pseudanarta.*
1882. Grt., Can. Ent., XIV, 19, *Pseudanarta.*
1889. Smith, Ent. Amer., v, 177, *Pseudanarta.*

HABITAT.—Southern Texas.

The type is in the British Museum and is a Heliothid, I think. It most resembles *Melicleptria*, and has the anterior tibia armed with a claw. I could not decide positively from the specimen where it best belonged and leave the species in the present genus until more material is at hand. It was unknown to me in 1889.

P. falcata Neum.

1883. Neum., Papilio, III, 141, *Pseudanarta.*
1889. Smith, Ent. Amer., v, 176, *Pseudanarta.*

HABITAT.—Arizona, Fort Huachuca.

The type is in the Neumœgen collection. I have had a recent chance to examine it, and find it a Heliothid, probably best referred to *Pseudanthœcia.* The material is too scant for positive reference and I leave it here with the probabilities indicated.

Genus **OLIGIA** Hbn.

1816. Hbn., Verzeichniss, 404.

A revision of the species of this genus will be found in Entomologica Americana, 1889, v, 145. The separation of the species there accords with the types so far as I have seen them, except where otherwise mentioned.

O. festivoides Gn.*

1852. Gn., Spec. Gen., Noct., I, 220, *Celæna.*
1856. Wlk., C. B. Mus., Het., x, 261, *Celæna.*
1881. Grt., Bull. Geol. Surv., v, 261, *Oligia.*
  varia Wlk.
1857. Wlk., C. B. Mus., Het., XII, 808, *Erastria.*
  cephalica Grt. MSS.
1891. Butler, Entomologist, XXIV, 241, pr. syn.

HABITAT.—Canada to Florida to Texas, west to Nebraska; Texas in March, April, and August; New York in May.

All the types are in the British Museum. Mr. Grote's name was never published, and would not have been cited here, but for Mr. Butler's note. *Erastria varia* is a well-defined specimen of this species.

O. chalcedonia Hbn.*

1815. Hbn., Eur. Schmett., Noct., 404, *Oligia.*
1816. Treit., Schmett. Eur., I, 74, *Bryophila.*
1852. Gn., Spec. Gen., Noct., I, 221, *Celæna.*
1856. Wlk., C. B. Mus., Het., X, 262, *Celæna.*
1891. Butler, Entomologist, XXIV, 240, *Mamestra.*
vincta Wlk.
1857. Wlk., C. B. Mus., Het., XII, 730, *Miana.*
1882. Grt., Ill. Essay, 44, pr. syn.
1891. Butler, Entomologist, XXIV, 240, pr. syn.
irresoluta Wlk.
1857. Wlk., C. B. Mus., Het., XII, 731, ? *Celæna.*
1882. Grt., Ill. Essay, 45, pr. syn.
1891. Butler, Entomologist, XXIV, 240, pr. syn.
arna Gn.
1852. Gn., Spec. Gen., Noct., I, 222, *Celæna.*
1856. Wlk., C. B. Mus., Het., X, 262, *Celæna.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 7, *Oligia.*
1889. Smith, Ent. Amer., V, 148, pr. syn.
tracta Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 204, pr. var.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 7, pr. syn.
1881. Grt., Bull. Geol. Surv., VI, 261, an var. pr.
1889. Smith, Ent. Amer., V, 148, pr. syn.
1891. Butler, Entomologist, XXIV, 240, pr. syn.

HABITAT.—Canada in June; New York in June; Maryland; Florida, Texas, March, April, and August; Colorado; New Mexico; Alabama in November.

The Walker and Grote types are in the British Museum; Guenée's type is from the Doubleday material and should be there also; but I did not see it.

I can not quite see why Mr. Butler refers *chalcedonia* to *Mamestra* and *festivoides* to *Oligia*. The two are surely closely enough related to be congeneric.

O. versicolor Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 204, *Oligia.*
1875. Grt., Can. Ent., VII, pl. I, f. 11, *Oligia.*

HABITAT.—Ontario in June; northern New York.

The species is in the British Museum, but apparently not the type specimen. Mr. Van Duzee has sent me the species from Buffalo.

O. exesa Gn.*

1852. Gn., Spec. Gen., Noct., I, 222, *Celæna.*
1856. Wlk., C. B. Mus., Het., X, 262, *Celæna.*
1881. Grt., Bull. Geol. Surv., VI, 265, *Oligia.*
floridiana Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 730, *Hadena.*
1891. Butler, Entomologist, XXIV, 241, pr. syn.

HABITAT.—Florida in March.

The types are in the British Museum, and Mr. Butler's reference is correct.

O. fuscimacula Grt.*

1881. Grt., Bull. Geol. Surv., vi, 262, 265, *Oligia*.

HABITAT.—Florida; Texas.

A "type" is in the British Museum; another in the Tepper collection.

O. grata Hbn.*

1819. Hbn., Zutræge, 16, f. 71, 72, *Elaphria*.
1816. Hbn., Verzeichniss, 230, *Elaphria*.
1856. Wlk., C. B. Mus., Het., x, 293, *Caradrina*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 22, *Carudrina*.
rasilis Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 158, *Hadena*.
1875. Grt., Can. Ent., vii, 58, pr. syn.
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 211, pr. syn.
1880. Grt., Can. Ent., xii, 86, pr. syn.
1881. Grt., Bull. Geol. Surv., vi, 265, pr. syn.

HABITAT.—Maryland to Kansas to Florida to Texas, March to September in every month.

Types of Mr. Morrison's species are in the Tepper collection, and in the museum at Cambridge. The species is a common one locally in the Southern States.

O. nucicolora Gn.*

1852. Gn., Spec. Gen., Noct., i, 24, pl. 4, f. 9, *Monodes*.
1856. Wlk., C. B. Mus., Het., x, 284, *Monodes*.
unisignata Wlk.
1856. Wlk., C. B. Mus., Het., ix, 189, *Laphygma*.
1891. Butler, Entomologist, xxiv, 241, *Laphygma*.
paginata Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., xxvii, 64, *Hadena*.
1881. Grt., Bull. Geol. Surv., vi, 265, *Oligia*.
clara Harv.
1878. Harv., Can. Ent., x, 57, *Caradrina*.

HABITAT.—Florida; Texas.

Mr. Morrison's type is in the Tepper collection; the others are in the British Museum. Mr. Grote suggested very doubtfully that Guenée might have intended to describe *paginata*; but figure and description pointed to *Platysenta atriciliata* so decidedly that I felt justified in making the reference in my recent list. Mr. Butler suggested that *paginata* might be *unisignata* Wlk., if the former was correctly named in the Museum. Harvey's type of *clara* is a dull, dark specimen, but unquestionably the same species.

Genus **PERIGEA** Gn.

1852. Gn., Spec. Gen., Noct., i, 225.

The species of this genus must be studied in connection with material from the West Indian fauna before a stable nomenclature can be attained. There are either several species resembling each other very closely or there are some that are widely distributed and somewhat variable.

P. xanthioides Gn.*

1852. Gn., Spec. Gen., Noct., I, 227, *Perigea.*
1856. Wlk., C. B. Mus., Het., X, 271, *Perigea.*
ab. **enixa** Grt.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 310, *Perigea.*
1882. Grt., New List, 28, pr. var.
1890. Grt., Revised Check List, 19, ab. pr.
1892. Beut., Bull. Am. Mus. N. H., IV, 69, larva.

HABITAT.—Canada; New York, southward to Florida; Northern States in March, June, and August; Texas in March, April, August.

Guenée's type is in the British Museum. Mr. Grote, Ill. Essay, 45, refers *P. mobilis* Wlk., C. B. M., Het., X, 277, as a synonym to this species, but I think incorrectly so. Walker's type is from the West Indies and differs quite evidently from our specimens. It may prove a geographical race eventually, but the material is not yet at hand to decide this positively. The type of *enixa* is also in the British Museum, and without a large amount of material certainly looks like a distinct species.

P. icole Grt.

1875. Grt., Proc. Bost. Soc. N. H., XVIII, 414, *Perigea.*

HABITAT.—Florida.

The type is in the British Museum.

P. vecors Gn.*

1852. Gn., Spec. Gen., Noct., I, 272, *Perigea.*
1856. Wlk., C. B. Mus., Het., X, 272, *Perigea.*
remissa Wlk.
1857. Wlk., C. B. Mus., Het., XI, 729, *Apamea.*
1882. Grt., Ill. Essay, 45=*luxa.*
luxa Grt.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 200, *Perigea.*

HABITAT.—New York in June and August; Massachusetts in July; southward to Florida and Texas; Colorado; District of Columbia in August.

The types of all the names are in the British Museum, and all refer to the same species. Mr. Grote's suggestion that Walker's name be abandoned because already used in an allied genus is settled by Guenée's taking it. *Vecors* had not been identified heretofore.

P. epopea Cram.*

1782. Cram., Pap. Exot., III, 144, pl. 272, G. & H., *Noctua.*
1852. Gn., Spec. Gen., Noct., I, 259, *Agrotis.*
1856. Wlk., C. B. Mus., Het., X, 338, ? *Agrotis.*
1883. Grt., Can. Ent., XV, 3, *Perigea.*
infelix Gn.
1852. Gn., Spec. Gen., Noct., I, 229, *Perigea.*
1856. Wlk., C. B. Mus., Het., X, 271, *Perigea.*
1883. Grt., Can. Ent., XV, 3, pr. syn.
palpalis Wlk.

1856. Wlk., C. B. Mus., Het., IX, 240, *Condica.*
1882. Grt., Ill. Essay, 43, =*infelix.*
confederata Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 143, *Hadena.*
1882. Grt., Ill. Essay, 43, =*infelix.*

HABITAT.—Gulf States, extending northward along the coast, occasionally to Maine. New York in October; District of Columbia in September.

The types of all save Cramer's species are in the British Museum. There are more names which I am certain refer to this same form; but I have given above all from our own literature. Herrich-Schæffer and Gundlach both use Guenée's name in their works.

P. claufacta Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 760, ?*Xylina.*
commoda Wlk.
1857. Wlk., C. B. Mus., Het., XI, 760, *Xylina.*
fabrefacta Morr.
1874. Morr., Proc., Bost. Soc. N. H., XVII, 146, *Segetia.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 7, *Perigea.*

HABITAT.—Massachusetts in September; New York, west to the Central States, south to Florida and Texas; Texas in November and December; District of Columbia in October.

The types are in the British Museum. *Claufacta* is a rubbed specimen, but of the normal type. *Commoda* is a more obscure form in which the white is almost eliminated. It is quite probable that Walker has still further described the species from South America, but I had no time to study the matter, and the relief of our own literature from unidentified names was my chief object.

C. punctifera Wlk.

1856. Wlk., C. B. Mus., Het., X, 263, *Celæna.*
semifurca Wlk.
1856. Wlk., C. B. Mus., Het., X, 732, *Celæna.*

HABITAT.—"United States;" St. Domingo.

Walker's types are in the British Museum. That of *punctifera* is one of Doubleday's specimens without locality and may have come from Florida. The other specimens are under the other name, one from the "West Indies," the other from Jamaica. Walker gives it from St. Domingo. The insect has the wing form of *albolabes*, but it is much smaller. It is like *fabrefacta* in color; the ordinary spots are well marked and the reniform is spotted with white.

P. falsa Grt.

1889. Grt. Can. Ent., XII, 215, *Perigea.*

HABITAT.—Havilah, California.

The type is in the British Museum. The insect has a curious resemblance to *Mamestra leucogramma.*

P. albolabes Grt.

1880. Grt., Can. Ent., XII, 216, *Perigea.*

HABITAT.—Prescott, Arizona; Colorado in August; New Mexico.

The type is in the British Museum.

P. loculosa Grt.

1881. Grt., Papilio, I, 154, *Perigea.*

HABITAT.—Tucson, Arizona; New Mexico.

Types are with Mr. Neumœgen and in the British Museum.

P. fasciata Hy. Edw.

1886. Hy. Edw., Ent. Amer., II, 169, *Perigea.*

HABITAT.—Colorado Desert.

The types are in Mr. Edwards's collection.

P. perplexa Grt.*

This species is not sanctioned by description so far as I can find. It is a common western form and has been quite generally distributed by Mr. Grote, the name appearing in his check list.

P. pulverulenta Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 105, *Perigea.*

HABITAT.—Colorado, Glenwood Springs in August.

Types are in the National Museum and with Mr. Neumœgen.

P. dilecta Hy. Edw.

1884. Hy. Edw., Papilio, IV, 123, *Perigea.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen, who says it is an *Ulolonche.*

P. continens Hy. Edw.

1884. Hy. Edw., Papilio, IV, 122, *Perigea.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

P. niveirena Harv.

1876. Harv., Can. Ent., VIII, 53, *Perigea.*

HABITAT.—Vancouver.

A type is in the British Museum; another in the Edwards collection.

P. benigna Hy. Edw.

1884. Hy. Edw., Papilio, IV, 122, *Perigea.*

HABITAT.—Arizona.

The type is with Mr. Neumoegen, and seems to be a rubbed specimen of *Hadena chryselectra.*

P. mersa Morr.

1875. Morr., Proc. Bost. Soc. N. H., xviii, 120, *Segetia.*

HABITAT.—California.

The type is in the Strecker collection.

P. proxima Morr.

1875. Morr., Proc. Bost. Soc. N. H., xviii, 240, *Segetia.*

HABITAT.—Texas.

Genus **DIPTERYGIA** Steph.

1829. Steph., Ill. Brit. Ent., Haust., ii, 167.

D. scabriuscula Linn.*

1758. Linn., Syst. Nat., ed. x, 516, *Noctua.*
1759. Clerck, Icones, t. 1, f. 8, *Noctua.*
1871. Stgr., Cat. Lep. Eur., 103, *Dipterygia.*
pinastri Linn.
1761. Linn., Fn. Suec., 315, 1188, *Noctua.*
1767. Linn., Syst. Nat., ed. xii, ii, 851, *Noctua.*
1787. Fabr., Mant. Ins., ii, 171, *Noctua.*
1789. Gmelin, in Linn., Syst. Nat., ed. xiii, v, 2569, *Noctua.*
1810. Hbn., Eur. Schmett., iv, pl. 51, f. 246, *Noctua.*
1816. Hbn., Verzeichniss, 244, *Calliergis.*
1829. Steph., Ill. Br. Ent., Haust., ii, 168, *Dipterygia.*
1852. Gn., Spec. Gen., Noct., i, 146, *Dipterygia.*
1856. Wlk., C. B. Mus., Het., x, 180, *Dipterygia.*
1862. Grt., Proc. Ent. Soc. Phil., i, 218, *Dipterygia.*
1871. Stgr., Cat. Lep. Eur., 103, pr. syn.

HABITAT.—Canada; Northern, Eastern, and Central United States, June to September; Colorado; Texas in March.

This is one of the species common to Europe and eastern North America, and has a much larger European bibliography, which it is not necessary to give here. It seems to have been seldom referred to in such way as to merit citation in our country.

Genus **HYPPA** Dup.

1844. Dup., Cat. Meth., iv, 231.

H. xylinoides Gn.*

1852. Gn., Spec. Gen., Noct., ii, 106, pl. 8, f. 11, *Hadena.*
1856. Wlk., C. B. Mus., Het., xi, 584, *Hadena.*
1870. Saund., Can. Ent., ii, 33, *Hadena*—larva.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 110, *Hyppa.*
1876. Grt., Stett. Ent. Zeit., xxxvii, 137, *Hyppa.*
rectilinea ‡ Wlk.
1857. Wlk., C. B. Mus., Het., xi, 579, *Hadena.*
1868. G. & R., Trans. Am. Ent. Soc., ii, 78, pr. syn.
contraria Wlk.
1857. Wlk., C. B. Mus., Het., xi, 627, *Xylina.*
1868. G. & R., Trans. Am. Ent. Soc., ii, 78, pr. syn.
ancocisconensis Morr.
1875. Morr., Can. Ent., vii, 188, *Hadena.*
1875. Grt., List Noctuidæ, 20, pr. syn.
1876. Grt., Stett. Ent. Zeit., xxxvii, 137, pr. syn.

HABITAT.—Canada to Virginia, west to the Central States; New Hampshire in August; Canada, July and August; New York, May, June, August, September; Illinois, August and September.

The types of *xylinoides* and *contraria* are in the British Museum and are correctly referred. Mr. Morrison's type I have not seen, but have seen specimens named by him, and Mr. Grote's reference is undoubtedly correct.

Genus **VALERIA** Germ.

1821. Germ., Mag. Ent., IV. p. ?
1829. Steph., Ill. Brit. Ent., Haust., III, 22.

V. opina Grt.

1878. Grt., Bull. Geol. Surv., IV, 178, *Dryobota.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 146, *Valeria.*

HABITAT.—California in October.

The type is in the British Museum. Mr. Graef also has one of the specimens from which the description was made.

Valeria is credited to Germar in literature, and the date given in the nomenclator is 1821. I have been unable to find that Germar uses the term at all, and on applying to Mr. Kirby, he informs me that he can find no earlier use of the term than that cited from Stephens. I give the citation from Germar as I find it; but it is incorrect.

Genus **CALOPHASIA** Steph.

1829. Steph., Ill. Br. Ent., Haust., II, 61.

C. strigata Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 107, *Calophasia.*

HABITAT.—Colorado.

The type is in the National Museum.

Genus **HOMOHADENA** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 180.

A monographic revision of the species will be found in the Proceedings of the United States National Museum for 1890, vol. XIII, 399–405, in which all the species are fully described.

H. incomitata Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 6, *Homohadena.*
1875. Harv., Can. Ent., VII, 136, *Homohadena.*

HABITAT.—Texas in May.

The type is in the British Museum.

H. inconstans Grt.

1883. Grt., Can. Ent., XV, 28, *Homohadena.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

H. figurata Harv.*

1875. Harv., Can. Ent., vii, 117, *Homohadena.*

Habitat.—Nevada; California; Colorado, Glenwood Springs in September.

The type is in the British Museum and seems to be a good species, distinct from *retroversa*, which it resembles from the description.

H. chorda Grt.

1880. Grt., Can. Ent., xii, 256, *Homohadena.*

Habitat.—Colorado; Sierra Nevada, California.

The type is in the British Museum.

H. epipaschia Grt.

1882. Grt., Proc. Kans. Ac. Sci., viii, 49, *Homohadena.*

Habitat.—Kansas; New Mexico.

The type is with Mr. Neumœgen.

H. vulnerea Grt.

1883. Grt., Can. Ent., xv, 29, *Homohadena.*

Habitat.—Arizona.

The type is in Mr. Neumœgen's collection.

H. deserta Smith.

1890. Smith, Proc. U. S. Nat. Mus., xiii, 402, *Homohadena.*

Habitat.—Colorado Desert.

The type is in the Edwards collection.

H. induta Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., ii, 274, *Homohadena.*
1875. Morr., Can. Ent., vii., 91 = *retroversa.*
1875. Harv., Can. Ent., vii, 118, *Homohadena.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 6, an sp. dist.

Habitat.—Texas, in April and May.

The type is in the British Museum.

H. retroversa Morr.*

1874. Morr., Proc. Bost. Soc. N. H., xvii, 157, *Homohadena.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 6 = *kappa.*
1890. Smith, Proc. U. S. Nat. Mus., xiii, 403, an sp. dist.

Habitat.—Missouri.

The type is in the Tepper collection. A duplicate is in the National Museum, named by Morrison, but scarcely like the type and much more like *kappa*. It is possible that the type will prove an aberrant *kappa*, as suggested by Dr. Harvey.

H. infixa Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 178, *Xylophasia.*
1890. Smith, Proc. U. S. Nat. Mus., xiii, 445, an *Homohadena?*
kappa Grt.
1874. Grt., Trans. Am. Ent. Soc., v, 92, *Homohadena.*

HABITAT.—Missouri; Iowa; Kansas; Texas; Florida, in October.

The types are in the British Museum. From Walker's description I suspected that his species would be referable to this genus, but it would not have been possible to identify it without seeing the type.

H. badistriga Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 20, *Hadena.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 181, *Homohadena.*
1875. Grt., Check List Noctuidæ, pl. i, f. 5, *Homohadena.*
1878. Lint., Ent. Contr., IV, 93, *Homohadena.*

HABITAT.—Canada and New York, in July; Maine to Texas; west to Kansas; Colorado.

The type is in the collection of the American Entomological Society.

Genus ADITA Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 63.

A. chionanthi S. & A.*

1797. S. & A., Ins. Ga., II, 195, pl. 98, *Phalæna.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 63, *Adita.*
1875. Morr., Ann. Lyc. Nat. Hist. N. Y., XI, 95, *Adita.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 155, 168, *Adita.*

HABITAT.—Georgia; New York; Canada, in August; Platte Cañon, Colorado.

Genus ONCOCNEMIS Led.

1857. Lederer, Noct. Eur., 94.

A monographic revision of the species of this genus will be found in the Trans. Am. Ent. Soc., XVI, 321–349, 1889, which should be consulted for specific characters.

O. hayesi Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 106, pl. 3, f. 13, *Oncocnemis.*

HABITAT.—Colorado, July, August, September; Nevada County, California, September; British Columbia.

The type is in the British Museum.

O. dayi Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 105, pl. 3, f. 8, *Oncocnemis.*
1877. Grt., Bull. Geol. Surv., III, 116, *Oncocnemis.*

HABITAT.—Colorado, 10,000 feet, August and September.

The type is in the British Museum.

O. mirificalis Grt.*

1879. Grt., Bull. Geol. Surv., V, 207, *Oncocnemis.*

HABITAT.—Nevada; California, Nevada County, in September.

The type is in the Edwards collection.

O. fasciatus Smith.*

1888. Smith, Insect Life, I, 18, *Oncocnemis.*

HABITAT.—Southwest Colorado, August 20; Nevada County, California, September.

The type is in the National Museum.

O. tenuifascia Smith.*

1888. Smith, Insect Life, I, 18, *Oncocnemis.*

HABITAT.—Colorado, August and September.

The type is in the Tepper collection; others in the National Museum.

O. atrifasciata Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 431, *Metahadena.*
1878. Grt., Can. Ent., X, 234, *Homohadena.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Homohadena.*
1889. Smith, Trans. Am. Ent. Soc., XVI, 329, *Oncocnemis.*

HABITAT.—Maine; New York, Adirondack Mountains.

A type is in the Tepper collection; another is in the British Museum.

O. terminalis Smith.*

1888. Smith, Insect Life, I, 19, *Oncocnemis.*

HABITAT.—Colorado, Denver and Boulder, in August.

The type is in the Tepper collection; another specimen is in the National Museum.

O. levis Grt.*

1880. Grt., Can. Ent., XII, 254, *Oncocnemis.*

HABITAT.—Arizona; Colorado, Golden City and Denver, in August, Glenwood Springs in September.

Types are in the British Museum, and in the U. S. National Museum; the latter originally given me by Mr. Grote himself. Still another is with Mr. Neumœgen.

O. simplex Smith.

1888. Smith, Insect Life, I, 20, *Oncocnemis.*

HABITAT.—Ashley Valley, Utah.

The type is in the Edwards collection.

O. augustus Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 73, pl. 3, f. 5, *Oncocnemis.*
1877. Grt., Bull. Geol. Surv., III, 176, *Oncocnemis.*

HABITAT.—Texas in October; Colorado in August.

The type is in the British Museum.

O. iricolor Smith.*

1888. Smith, Insect Life, I, 19, *Oncocnemis.*

HABITAT.—Colorado; Denver in August and September.

Types are in the National Museum and in the Tepper collection.

O. saundersiana Grt.*

1876. Grt., Can. Ent., VIII, 29, *Oncocnemis*.
1889. Smith, Trans. Am. Ent. Soc., XVI, 337, *Oncocnemis*.

HABITAT.—Texas in October; Illinois; Missouri in July; Canada.

The type is in the British Museum. This is a most curiously distributed species, occurring in isolated specimens only.

O. behrensi Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 65, *Oncocnemis*.
1877. Grt., Bull. Geol. Surv., III, 116, *Oncocnemis*.

HABITAT.—California in February.

The type is in the British Museum.

O. pernotata Grt.

1883. Grt., Can. Ent., XV, 25, *Oncocnemis*.

HABITAT.– Arizona.

The type is in the Neumœgen collection.

O. glennyi Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 141, pl. 4, f. 17, *Oncocnemis*.

HABITAT.—Colorado, July; Denver in September and October.

The type is in the British Museum.

O. homogena Grt.

1874. Grt., Bull. Geol. Surv., III, 800, *Oncocnemis*.

HABITAT.—Colorado in August.

The type is in the British Museum.

O. extremis Smith.

1890. Smith, Ent. Amer., VI, 30, *Oncocnemis*.

HABITAT.—Northwest British Columbia.

The type is with Mr. Neumœgen.

O. occata Grt.*

1874. Grt., Trans. Am. Ent. Soc., V, 114, *Cleophana*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 9, 16, pl. II, f. 6, *Cleophana*.
1876. Grt., Bull. Buff. Soc. Nat., Sci., III, 87, *Oncocnemis*.
1876. Grt., Stett. Ent. Zeit., XXXVII, 136, *Oncocnemis*.

HABITAT.—Texas, February and March; California, April and May; Colorado in August.

The type is in the British Museum.

O. meadiana Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 60, *Oncocnemis*.
1877. Grt., Bull. Geol. Surv., III, 117, *Oncocnemis*.

HABITAT.—Arizona.

The type is in the Tepper collection.

O. fortis Grt.*

1880. Grt., Can. Ent., XII, 257, *Homohadena.*
1889. Smith, Trans. Am. Ent. Soc., XVI, 340, *Oncocnemis.*
picina Grt.
1880. Grt., Can. Ent., XII, 257, *Homohadena.*
1890. Smith, Proc. U. S. Nat. Mus., XIII, 401, *Homohadena.*
vorax Behrens.
1884. Behrens, Papilio, IV, 24, *Agrotis* (larva only).
1884. Smith, Papilio, IV, 114, *Polia* (desc. imago).
1889. Smith, Trans. Am. Ent. Soc., XVI, 340, pr. syn.

HABITAT.—Nevada; California.

The type of *picina* is in the British Museum; that of *fortis* is in the Tepper collection, and that of *vorax* I have had from Dr. Behrens for description. They all refer to one species only, slightly variable in ground color and in the relative distinctness of the punctiform markings. I did not know *picina* when I wrote, but suspected the synonymy from the descriptions.

O. chandleri Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 107, pl. 3, f. 9, *Oncocnemis.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 87, *Oncocnemis.*
1877. Grt., Bull. Geol. Surv., III, 17, *Oncocnemis.*

HABITAT.—Colorado, in July, August, and September; Nevada.

The type is in the British Museum; a specimen marked "type" by Mr. Morrison is in the National Museum.

O. riparia Morr.*

1875. Morr., Can. Ent., VII, 213, an var. *chandleri.*
1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 87, = *chandleri.*
1876. Grt., Stett. Ent. Zeit., XXXVII, 117, = *chandleri.*
1877. Grt., Bull. Geol. Surv., III, 117, *chandleri.*
1879. Tepper, Bull. Bkln. Ent. Soc., I, 31, locality and habits.
1880. Grt., Can. Ent., XII, 256, = *chandleri.*
1881. Grt., Papilio, I, 34, an sp. dist.?
1889. Smith, Trans. Am. Ent. Soc., XVI, 343, dist. charact.

HABITAT.—Long Island, Buffalo, New York; Isle of Shoals, Massachusetts, in July.

A "type" is in the Tepper collection; another in the British Museum from the Grote material.

O. colorada Smith.*

1892. Smith, Ent. News, IV, 100, pl. VI, fig. 5, *Oncocnemis.*

HABITAT.—Central and western Colorado, July, August, and October.

The type is in the National Museum.

O. major Grt.*

1880. Grt., Papilio, I, 33, *Oncocnemis*.
1889. Smith, Trans. Am. Ent. Soc., XVI, 344, *Oncocnemis*.
aqualis Grt.
1881. Grt., Papilio, I, 33, *Oncocnemis*.
1889. Smith, Trans. Am. Ent. Soc., XVI, 345, *Oncocnemis*.
curvicollis Grt.
1883. Grt., Can. Ent., XV, 10, *Oncocnemis*.
1889. Smith, Trans. Am. Ent. Soc., XVI, 344, pr. syn.

HABITAT.—Arizona; Colorado, Salida in July; California.

Types of *major* are in the Neumœgen collection and in the British Museum. The types of *curvicollis* are in the National Museum and in the Neumœgen and Graef collections and have been already referred to *major* by me. The type of *aqualis* is in the British Museum, and is also the same as *major;* it is smaller, and the dashes in the s. t. space are not interrupted; but this is a variable character, and in the type of *major* in the Museum, they are barely to be termed interrupted. The British Museum types both of *major* and *aqualis* are females.

O. oblita Grt.

1877. Grt., Bull. Geol. Surv., III, 117, *Oncocnemis*.

HABITAT.—Nevada.

The type is in the British Museum. It agrees well with the description, but does not seem to be an *Oncocnemis;* at least I can not make out a claw to the fore tibia. I have seen the species without recognizing it. Mr. Grote states positively "Fore tibiæ with a short claw," and as it is possible that the type specimen has become defective, I can not at present dispute the reference.

O. cibalis Grt.*

1880. Grt., Can. Ent., XII, 244, *Oncocnemis*.

HABITAT.—Colorado in October.

The type is with Mr. Graef.

O. gracillima Grt.*

1881. Grt., Can. Ent., XIII, 231, *Oncocnemis*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

O. atricollaris Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 273, *Homohadena*.
1875. Morr., Can. Ent., VII, 91, *Copihadena*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 73, *Oncocnemis*.
1877. Grt., Bull. Geol. Surv., III, 117, *Oncocnemis*.
1881. Grt., Papilio, I, 34, *Oncocnemis*.

HABITAT.—Texas in March and May; Arizona; Colorado in August.

I have not seen the type, nor have I been able to find where it is.

O. griseicollis Grt.

1882. Grt., Can. Ent., XIV, 19, *Oncocnemis*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

O. aterrima Grt.

1879. Grt., Can. Ent., XI, 199, *Oncocnemis*.
1889. Smith, Trans. Am. Ent. Soc., XVI, 324, an *Heliothid*.

HABITAT.—California.

Types are in the Edwards collection and in the British Museum. The Edwards specimen I had seen when I wrote in 1889, and the Museum specimen simply confirms my opinion. The anterior tibiæ are as in *Melicleptria*, shortened, with a single stout claw. The wings are broad, trigonate, the head small, eyes ovate. I leave it here until a new study of the Heliothid series brings it into a more natural relationship.

Genus **APOROPHYLA** Gn.

1841. Gn., Ind. Meth., Ann. Soc. Ent. Fr., x, 246.

A. yosemitæ Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 113, 145, pl. iii, f. 3, *Cucullia*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 309, *Aporophyla*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 349, *Aporophyla*.

HABITAT.—Yosemite, California, October 12.

The type is in the Edwards collection.

Genus **MACRONOCTUA** Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 27.

M. onusta Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 27, *Macronoctua*.

HABITAT.—Maine, in September; New York; New Jersey; Illinois; Iowa.

I do not know where the type of this species is to be found at present. I did not see it in the British Museum.

Genus **LATHOSEA** Grt.

1881. Grt., Bull. Geol. Surv., VI, 270.

L. pullata Grt.

1881. Grt., Bull. Geol. Surv., VI, 270, *Lathosea pulla*.
1890. Grt., Revised List Noct., 14, *L. pullata*.

HABITAT.—Oregon; Colorado.

The type is in the British Museum. It is a robust, xylinoid form with retracted head and short tongue, and has the appearance of *Scotochrosta*. The markings are strigate as in the Cucullid series and it is a rather near ally of my *Pleroma*, I think. It seems a little out of place here; but until the material can be critically studied it had better be left as it is. Mr. Bruce has recently sent me a specimen from Colorado, which agrees fairly well with the type.

Genus **HADENELLA** Grt.

1883. Grt., Papilio, III, 123.

H. pergentilis Grt.*

1883. Grt., Papilio, III, 123, *Hadenella.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 156, 169, *Hadenella.*
1883. Grt., Can. Ent., XV, 122, *Hadenella.*

HABITAT.—Washington; Colorado; Wyoming.

Types are in the Neumœgen collection.

Genus **TRICHOPOLIA** Grt.

1883. Grt., Papilio, III, 76.

T. dentatella Grt.

1883. Grt., Papilio, III, 76, *Trichopolia.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

T. ptilodonta Grt.

1883. Grt., Papilio, III, 77, *Trichopolia.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

Genus **DRYOBOTA** Led.

1857. Lederer, Noct. Eur., 100.

None of the species heretofore described under this generic term belong to it. The small species recently described by myself are better placed in *Cleoceris*, as I find by examining the European forms. Mr. Grote's species, antedated by Walker, can not remain here; but as I have no more convenient place for it just now, no change is made.

D. illocata Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 758, *Hadena.*
stigmata Grt.
1875. Grt., List Noctuidæ, 23, *Dryobota.*
1877. Grt., Can. Ent., IX, 199, *Dryobota.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 108, ? *Dryobota.*

HABITAT.—Canada; Eastern, Middle, and Central States; Colorado; Massachusetts in September; New York, August and September.

The types are in the British Museum and refer to one species only. Walker's species was described from "locality unknown."

Genus **PACHYPOLIA** Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 27.

P. atricornis Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 27, *Pachypolia.*
1875. Grt., List Noctuidæ, pl. f. 8, *Pachypolia.*

HABITAT.—Illinois, in October.

The type in the British Museum has pointed wings, color and type of maculation as in *occulta*, but with lengthily pectinated male antennæ. I do not remember having seen the species previously.

Genus **POLIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 73.

Two quite distinct types are referred to this genus in our American material. Whether they can remain associated is questionable, but need not be decided here.

P. aedon Grt.

1880. Grt., Can. Ent., XII, 154, *Polia*.

HABITAT.—Colorado, in August; Nevada; Washington.

A type is in the British Museum; another with Mr. Neumœgen.

P. theodori Grt.*

1878. Grt., Can. Ent., x, 235, *Apatela*.
1880. Grt., Can. Ent., XII, 219, *Polia*.
1882. Grt., Ill. Essay, 55, pl., II, f. 17, *Polia*.
var. **epichysis** Grt.
1880. Grt., Can. Ent., XII, 219, *Polia*.
1882. Grt., Ill. Essay, 55, pl., II, f. 18, *Polia*.

HABITAT.—Colorado, August and September; New Mexico, California.

Both types are in the British Museum. I have seen considerable material of both forms and have no doubt of their relationship. Mr. Hy. Edwards first suggested it to me some years ago.

P. olorina Grt.

1876. Grt., Bull. Buff. Soc. Nat. Sci., III, 84, *Hadena*.

HABITAT.—California; Colorado.

The type is in the British Museum; another specimen, also marked "type," is in the Edwards collection. The species is allied to *Polia theodori* and varies in the direction of suffusion with black.

P. diversilineata Grt.*

1877. Grt., Bull. Geol. Surv., III, 119, *Hadena*.
illepida Grt.
1879. Grt., Can. Ent., XI, 95, *Polia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 156, *Polia*.

HABITAT.—New Mexico; Nevada; Colorado; Manitou in July.

The type of *diversilineata* is a badly patched specimen covered with mildew, in the Cambridge collection. The type of *illepida* is in the British Museum; others, labeled by Mr. Grote, but not marked type, are in the National Museum. The two names refer to the same species.

P. confragosa Morr.*

1874. Morr., Proc. Bost. Soc. Nat. Hist., xvii, 138, *Polia*.

HABITAT.—Quebec, Canada; Wisconsin.

The type is with Prof. F. K. Belanger, and must be a strongly marked insect, from the description. The National Museum specimens are from the Meske collection and may not be well named.

P. speciosa Morr.

1874. Morr., Proc. Bost. Soc. N. H., xvii, 137, *Polia*.

HABITAT.—Cambridge, Mass., July 17.

The type is in the Graef collection.

P. pallifera Grt.

1877. Grt., Can. Ent., ix, 88, *Polia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 156, *Polia*.

HABITAT.—Illinois.

The type is in the British Museum and is a species I had not before seen.

P. pulverulenta Smith.*

1891. Smith, Trans. Am. Ent. Soc., xviii, 106, *Polia*.

HABITAT.—Colorado in September.

The type is in the National Museum. The species is unlike any in the British Museum and does not agree with the description of the others.

P. contacta Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 58, *Acronycta*.
1882. Grt., Ill. Essay, 39, *Polia*.
aspera Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 134, *Acronycta*.
1880. Grt., Can. Ent., xii, 186, *Polia*.
1880. Grt., Bull. Bkln. Ent. Soc., iii, 37, *Polia*.
diffusilis Harv.
1878. Harv., Can. Ent., x, 56, *Polia*.
1880. Grt., Bull. Bkln. Ent. Soc., iii, 37, *aspera*.
1880. Grt., Can. Ent., xii, 186, =*aspera*.
1882. Grt., Ill. Essay, 39, *contacta*.

HABITAT.—Hudson's Bay Territory; Adirondack Mountains, New York, in August.

Types of *contacta* and *diffusilis* are in the British Museum, though I did not see the *contacta*. Mr. Grote apparently did see it, and as he had the type of Harvey's species his reference can be taken as correct. The type of *aspera* is in the Tepper collection, and is the same as *diffusilis* type.

P. medialis Grt.

1876. Grt., Ann. Lyc. Nat. Hist., N. Y., XI, 306, *Polia*.

HABITAT.—Canada; Schenectady, New York, in September.

The type is in the British Museum. It is a broad-winged form; looks like *Agrotis trabalis* and has the structural characters of *Dryobota stigmata*. The male antennæ are pectinated.

P. acutissima Grt.

1875. Grt., Check List Noct., 23, pl., f. 9, *Pachypolia*.
1881. Grt., Bull. Geol. Surv., VI, 267, *Polia*.

HABITAT.—Canada, Montreal; Nova Scotia.

The type is in the British Museum. It resembles *medialis*, but is much larger and a broader winged form.

Genus **FISHIA** Grt.

1877. Grt., Can. Ent., IX, 21.

F. enthea Grt.

1877. Grt., Can. Ent., IX, 21, *Fishia*.

HABITAT.—Oldtown, Maine.

The type is in the British Museum and is a species I had not before seen. It has the appearance of *Hadena evelina* French, and in structure is an *Hadena* with brush-like male antennæ.

Genus **ACTINOTIA** Hbn.

1816. Hbn., Verzeichniss, 244.

A. ramosula Gn.*

1852. Gn., Spec. Gen., Noct., II, 114, pl. 9, f. 1, *Cloantha*.
1857. Wlk., C. B. Mus., Het., XI, 616, *Auchmis*.
1873. Grt., Bull. Buff. Nat. Sci., I, 83, pl. II, f. 16, *Cloantha*.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States; May, June, August, and September.

A. stewarti Grt.

1875. Grt., Can. Ent., VII, 28, *Actinotia*.

HABITAT.—California.

The type is in the British Museum, a duplicate thereof in the Edwards collection.

Genus **LUSSA** Grt.

1883. Grt., Can. Ent., XV, 127.

L. nigroguttata Grt.

1883. Grt., Can. Ent., XV, 127, *Lussa*.

HABITAT.—Florida.

The type is in the Neumœgen collection. Mrs. Slosson has tak
species at Charlotte Harbor. It looks like a West Indian
may be previously described from that locality.

Genus LAPHYGMA Gn.

1852. Gn., Spec. Gen., Noct., I, 156.

L. frugiperda S. & A.*

1797. S. & A., Ins. Ga., II, 191, pl. 96, *Phalæna.*
1832. Geyer, Zutræge, 22, No. 342, ff. 683, 684, *Trigonophora.*
1852. Gn., Spec. Gen., Noct., I, 159, *Laphygma.*
1856. Wlk., C. B. Mus., Het., IX, 189, *Laphygma.*
1882. Riley, Papilio, II, 43, *Laphygma.*
1885. Riley, 4th Rept. U. S. Ent. Comm., 353, pl. 62, f. 2, *Laphygma.*
macra Gn.
1852. Gn., Spec. Gen., Noct., I, 157, *Laphygma.*
1868. H. Sch., Corr. Blatt, 1868, 115, pr. syn.
signifera Wlk.
1856. Wlk., C. B. Mus., Het., IX, 193, *Prodenia.*
plagiata Wlk.
1856. Wlk., C. B. Mus., Het., IX, 194, *Prodenia.*
autumnalis Riley.
1871. Riley, 3d Rept. Ins. Mo., 109, ff. 44–49, *Prodenia.*
1871. Riley, Am. Ent., II, 363, ff. 221, 223, *Prodenia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, =*frugiperda.*
1876. Riley, 8th Rept. Ins. Mo., 48, ff. 26, 27, *Prodenia.*
1881. Grt., Can. Ent., XIII, 91, =*frugiperda.*
var. **fulvosa** Riley.
1876. Riley, 8th Rept. Ins. Mo., 49, *Prodenia.*
var. **obscura** Riley.
1876. Riley, 8th Rept. Ins. Mo., 49, *Prodenia.*

HABITAT.—Canada, south to Florida and Texas, west to Missouri, Nebraska, Kansas; Jamaica; Brazil; August, September and October.

The economic bibliography of this insect is large, and only a mere outline is here given to accredit the species and varieties.

The types of *macra* and of Walker's species are in the British Museum. Dr. Riley's types are in the National Museum.

L. flavimaculata Harv.*

1876. Harv., Can. Ent., VIII, 54, *Caradrina.*
1876. Grt., Can. Ent., VIII, 189, = *L. frugiperda.*
1890. Grt., Revised Check List, 23, an sp. dist.

HABITAT.—California, March, April, August to November; Colorado.

The type is in the British Museum. A fine series of specimens in the National Museum, many of them bred, long since led me to the conclusion that the species was a good one, but better referred to *Laphygma* than to *Caradrina.*

L. inflexa Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 65, *Laphygma.*

HABITAT.—Florida.

The type is in the Tepper collection. To the kindness of Prof. Cook I owe an opportunity of studying the type. It is, like so many of Morrison's types, a poor specimen, and will probably be found referable to [illegible]*ssa* Grt., and a not distant relative of *L. nigroguttata.*

Genus **PRODENIA** Gn.

1852. Gn., Spec. Gen., Noct., i, 159.

P. eridania Cram.*

1782. Cram., Pap. Exot., iv, 133, pl. 358, f. E and F, *Phalæna.*
1816. Hbn., Verzeichniss, 244, *Calliergis.*
1852. Gn., Spec. Gen., Noct., i, 148, *Xylomiges.*
1856. Wlk., C. B. Mus., Het., ix, 182, ? *Xylomiges.*
phytolaccæ S. & A.
1797. S. & A., Ins. Ga., ii, 193, pl. 97, *Phalæna.*
1852. Gn., Spec. Gen., Noct., i, 148, pr. var.
1856. Wlk., C. B. Mus., Het., ix, 183, pr. syn.
1873. Grt., Bull. Buff. Soc. Nat. Sci., ii, 28, *Xylomiges.*
1879. Grt., Can. Ent., xi, 215, *Prodenia.*
derupta Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 62, *Actinotia.*
1879. Grt., Can. Ent., xi, 205, ?=*phytolaccæ.*
1880. Grt., Can. Ent., xii, 186, =*phytolaccæ.*
nigrofasciata Hulst.
1881. Hulst, Bull. Bkln. Ent. Soc., iii, 77, *Leucania.*
1881. Hulst, Bull. Bkln. Ent. Soc., iv, 7, pl. i, f. 9, *Leucania.*
1891. Smith, List Lepidoptera, 45, pr. syn.

HABITAT.—Georgia; Florida; Texas in September; Central and South America.

A distinctly marked yet strongly variable species. The names above given apply to our own fauna only; the insect has been further redescribed by Walker as *Xylina inquieta*, *Prodenia strigifera*, and *Leucania externa*, and by Mr. Butler as *Prodenia ignobilis.* The types of these latter are in the British Museum. Mr. Hulst's type is now at Rutgers, and Mr. Morrison's is with Mr. Graef. I think there are yet more names, but as they are based on other than boreal American specimens, they are not noted here.

P. commelinæ S. & A.*

1797. S. & A., Ins. Ga., ii, 189, pl. 95, *Phalæna.*
1816. Hbn., Verzeichniss, 217, *Trigonophora.*
1852. Gn., Spec. Gen., Noct., i, 162, *Prodenia.*
1856. Wlk., C. B. Mus., Het., ix, 193, *Prodenia.*

HABITAT.—Massachusetts; District of Columbia, August to October, southward; Texas in December; Illinois, August and September.

Hübner and Herrich-Schæffer both refer this as the same as *androgena* Cramer, while Guenée refers to them as distinct species. The matter is not an important one for present settlement. Gundlach in his Contributions describes also the early stages.

P. ornithogalli Gn.*

1852. Gn., Spec. Gen., Noct., i, 163, *Prodenia.*
1856. Wlk., C. B. Mus., Het., ix, 193, *Prodenia.*
1882. Riley, Papilio, ii, 43, *Prodenia.*
lineatella Harv.
1874. Harv., Bull. Buff. Soc. Nat. Sci., ii, 275, *Prodenia.*
1881. French, Can. Ent., xiii, 21, larva.

1882. Riley, Papilio, II, 43, ? pr. syn.
commelinæ ‡ Riley.
1869. Riley, 1st Rept. Ins. Mo., 87, *Prodenia.*
1871. Riley, 3d Rept. Ins. Mo., 113, f. 48*b*, *Prodenia.*
1871. Riley, Amer. Ent., II, 62, f. 41, *Prodenia.*
1875. Grt., Check List Noct., 11, pr. syn.
1881. Riley, Supplt. and Index to Mo. Repts., 56, pr. syn.

HABITAT.—Massachusetts in July; New York, southward to Florida, west to Minnesota; Nebraska; California in April, September, and October; Texas in April and October.

Dr. Harvey's type is in the British Museum, and is like specimens of Guenée's species, apparently typical, though not the types.

P. eudiopta Gn.*

1852. Gn., Spec. Gen., Noct., I, 164, *Prodenia.*
1856. Wlk., C. B. Mus., Het., IX, 193, *Prodenia.*
flavimedia Harv.
1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 274, *Prodenia.*
1882. Riley, Papilio, II, 43, =*ornithogalli.*
commelinæ ‡ Riley.
1871. Riley, 3d Rept. Ins. Mo., 113, f. 48*c*, *Prodenia.*
1881. Riley, Supplt. and Index to Mo. Repts., 56, pr. syn.

HABITAT.—Massachusetts in September; New York to Florida; Texas in April; Missouri; Nebraska; California; District of Columbia in August.

The type of *flavimedia* is in the British Museum and is like specimens of *eudiopta*, typical though not types of Guenée's species.

P. præfica Grt.*

1875. Grt., Can. Ent., VII, 44, *Prodenia.*

HABITAT.—California in June.

The type is in the British Museum.

Genus **DARGIDA** Wlk.

1856. Wlk., C. B. Mus., Het., IX, 201.

D. procinctus Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 138, pl. IV, f. 6, *Eupsephopæctes.*

HABITAT.—California, March, June, August, September, October; Colorado in October; Portland, Oregon, April, May.

The type is in the British Museum. In the Berliner Museum I saw specimens of *Dargida grammivora* Wlk., that very strongly resemble our species and agree perfectly in generic characters. Mr. Grote's generic term *Eupsephopæctes* must sink.

Genus **CONSERVULA** Grt.

1875. Grt., Check List Noct., 11.

C. anodonta Gn.*

1852. Gn., Spec. Gen., Noct., II, 63, pl. VII, f. 8, *Phlogophora.*
1857. Wlk., C. B. Mus., Het., XI, 541, *Phlogophora.*
1875. Grt., Check List Noct., 11, *Conservula.*

HABITAT.—Canada; Maine; Vermont, in July and August; northern New York in July.

The type is in the British Museum.

Genus **TRIGONOPHORA** Hbn.

1816. Hbn., Verzeichniss, 217.

T. periculosa Gn.*

1852. Gn., Spec. Gen., Noct., II, 65, *Phlogophora.*
1857. Wlk., C. B. Mus., Het., XI, 542, *Phlogophora.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 17, *Trigonophora.*
var. **V-brunneum** Grt.*
1875. Grt., Check List Noct., 23, *Trigonophora.*
1882. Grt., New List, 29, an var. pr.

HABITAT.—Newfoundland; Canada in July and August; northern, eastern, and central United States, July to September; Colorado; British Columbia.

The types, both of the species and variety, are in the British Museum.

Genus **BROTOLOMIA** Led.

1857. Lederer, Noct. Eur., 115.

B. iris Gn.*

1852. Gn., Spec. Gen., Noct., II, 64, *Phlogophora.*
1857. Wlk., C. B. Mus., Het., XI, 542, *Phlogophora.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 110, *Brotolomia.*

HABITAT.—Canada; Northern, Middle, and Central States, June and July.

The type is in the British Museum. Our species is probably as distinct generically from the European form as are any others in this series, and if the other genera hold, a new genus, *Mesolomia mihi*, must be used for *iris*.

Genus **EUPLEXIA** Steph.

1829. Steph., Ill. Brit. Ent., Haust., III, 3.

E. lucipara Linn.*

1758. Linn., Syst. Nat., ed. X, 518, *Noctua.*
1761. Linn., Fn. Suec., 1201, *Noctua.*
1767. Linn., Syst. Nat., ed. XII, II, 857, *Noctua.*
1781. Fabr., Spec. Ins., II, 233, *Noctua.*
1793. Fabr., Ent. Syst., III, 2, 99, *Noctua.*
1816. Hbn., Verzeichniss, 217, *Trigonophora.*
1829. Steph., Ill. Brit. Ent., Haust., III, 1, *Euplexia.*
1851. Gn., Spec. Gen., Noct., II, 68, *Euplexia.*
1857. Wlk., C. B. Mus., Het., XI, 543, *Euplexia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 153, *Euplexia.*
1874. Morr., Psyche, I, 22, ♂ organs.
1883. Hy. Edw., Papilio, III, 133, larva.
1889. Dyar, Can. Ent., XXI, 137, life history.

HABITAT.—United States generally, May to August; Europe.

For the European bibliography Staudinger and other similar works should be consulted. In America the species has been but rarely referred to.

Genus **NEPHELODES** Gn.

1852. Gn., Spec. Gen., Noct., I, 129.

N. minians Gn.*

1852. Gn., Spec. Gen., Noct., I, 130, *Nephelodes*.
1856. Wlk., C. B. Mus., Het., IX, 163, *Nephelodes*.
1878. French, in 7th Rept. Ins. Ills., 99, 220, larva.
1878. French, Can. Ent., X, 61, larva.
1880. Riley, Amer. Ent., III, 205, larva.
1881. Riley, Amer. Nat., XV, 575, 577, larva.
1883. Lint., 1st Rept. State Ent., N. Y., 99, ff. 24, 25, life history.
expansa Wlk.
1857. Wlk., C. B. Mus., Het., XI, 399, *Graphiphora*.
1865. Wlk., C. B. Mus., Het., XXXV, 1957, pr. syn.
1868. G. and R., Trans. Am. Ent. Soc., II, 78, pr. syn.
sobria Wlk.
1857. Wlk., C. B. Mus., Het., XI, 744, *Graphiphora*.
var. **violans** Gn.
1852. Gn., Spec. Gen., Noct., I, 130, *Nephelodes*.
1856. Wlk., C. B. Mus., Het., IX, 163, *Nephelodes*.
1882. Grt., New List, 29, pr. var.
subdolens Wlk.
1857. Wlk., C. B. Mus., Het., X, 405, *Graphiphora*.

HABITAT.—Canada; United States generally; Eastern States in August and September; Colorado, August to October.

The types of all the names are in the British Museum. *G. expansa* Wlk., I did not find; but as Walker has himself referred it as a synonym, he may have removed the label—or what is equally possible, I overlooked the specimen, though I found all the others referable here. *G. sobria* is from Bogota, while *subdolens* is from "locality unknown."

Genus **TRICHOLITA** Grt,

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 211, 215.

T. signata Wlk.*

1860. Wlk., Can. Nat. and Geol., V, 253, *Nephelodes*.
1877. Grt., Can. Ent., IX, 28, *Tricholita*.
semiaperta Morr.
1874. Morr., Can. Ent., VI, 105, *Hydrœcia*.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 150, *Perigrapha*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 211, 215, *Tricholita*.
1875. Grt., Stett. Ent. Zeit., XXXVI, 341, *Tricholita*.
1877. Grt., Can. Ent., IX, 28, pr. syn.

HABITAT.—Canada; New York and Illinois in July and August; Massachusetts in August; Northern, Eastern, Middle, and Central States; New Mexico.

Mr. Morrison's type is in the Tepper collection. The Walker type is in the collection of the Entomological Society of Ontario, and has been examined by Mr. Grote, who is responsible for its reference to *semiaperta.* I can not quite understand why Mr. Grote, after positively making it a synonym, should still continue to list *semiaperta* without any reference to *signata.*

T. fistula Harv.*

1878. Harv., Can. Ent., x, 56, *Tricholita.*

HABITAT.—California; Arizona; Colorado in September.

The type is in the British Museum. In the Neumœgen collection Mr. Grote has labeled specimens of this same species *T. completa* Grt., type; but I have not found any description of a species under that name. I included the name in my list on the faith of this label, but it must be omitted hereafter.

T. inconspicua Grt.

1883. Grt., Can. Ent., xv, 129, *Tricholita.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

Genus **HELOTROPHA** Led.
1857. Lederer, Noct. Eur., 118.

A. reniformis Grt.*

1874. Grt., Can. Ent., VI, 14, *Luperina.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 18, *Helotropha.*
1876. Speyer, Stett. Ent. Zeit., XXXVI, 202, ? an var. *fibrosa.*
var. **atra** Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 200, pr. var.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 419, sp. dist. pr.
1882. Grt., New List, 29, pr. var.

HABITAT.—Canada; Northern, Middle, and Central States; July to September.

The type of *reniformis* is in the collection at Cambridge; that of *atra* I have not seen, nor do I know where it is.

Genus **HYDRŒCIA** Gn.
1837. Gn., Essai sur la class. Noct., 237.
1852. Gn., Sp. Gen., Noct., I, 125.

The species here placed under this genus have been transferred to *Gortyna*, to *Apamea*, and again to *Hydrœcia* by Mr. Grote, as his ideas of types and other matters changed. These changes are not all noted here. In using *Hydrœcia* now I follow European precedent. It is quite likely that some of the species do not belong here.

H. lunata Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 110, *Apamea.*
1891. Smith, List Lepidoptera, 45, *Hydrœcia.*

HABITAT.—California, Alameda in June, Mount Shasta district.

Types are in the National Museum and in the Edwards collection.

H. u-album Gn.*

1852. Gn., Spec. Gen., Noct., I, 345, *Ceramica.*
1856. Wlk., C. B. Mus., Het., x, 418, *C. v-album.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, *C. w-album.*
1891. Smith, Proc. U. S. Nat. Mus., XIV, 231, *Mamestra.*
purpuripennis Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 206, *Apamea.*
baliola Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 148, *Orthosia.*
1875. Grt., Can. Ent., VII, 58, = *purpuripennis.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 309, = *purpuripennis.*

HABITAT.—Massachusetts, May, June, August; New York; Illinois; Minnesota.

Guenée's type is in the British Museum. Messrs. Morrison and Grote described at nearly the same time, both from material collected by Mr. Thaxter, who probably has both types.

H. velata Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 671, *Apamea.*
1891. Smith, Can. Ent., XXIII, 121, *Apamea.*
sera G. & R.
1868. G. & R., Trans. Am. Ent. Soc., I, 345, pl. 7, f. 55, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 18, *Hydrœcia.*
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 206, *Apamea.*
1882. Grt., Can. Ent., XIV, 170, *Helotropha.*
1884. Bean, Can. Ent., XVI, 67, larva on *Anemone.*
1891. Smith, Can. Ent., XXIII, 121, pr. syn.

HABITAT.—Canada; Maine to Pennsylvania; west to Missouri; Iowa, June, July, and August.

Walker's type is in the National Museum. I do not know where Grote and Robinson's type is at present.†

H. juvenilis Grt.*

1881. Grt., Bull. Geol. Surv., VI, 267. *Gortyna.*
1881. Grt., Trans. Kans. Ac. Sci., VII, 68, *Gortyna.*

HABITAT.—Colorado; Kansas.

The type is in the British Museum.

H. nictitans Linn.*

1761. Linn., Fn. Suec., 1215, *Noctua.*
1767. Linn., Syst. Nat., ed. XII. 847, *Noctua.*
1792. Bkh., Eur. Schmett., IV, 463, *Noctua.*
1816. Ochs., Schmett. Eur., IV, 75, *Apamea.*
1816. Hbn., Verzeichniss, 232, *Sideridis.*
1852. Gn., Spec. Gen., Noct., I, 126, *Hydrœcia.*

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† From this point to *Xylomiges*, my references to dates and localities are less complete, owing to the fact that the set of galley proofs first corrected by me were lost en route or mislaid at the printing office. I threw away the note slips after I had entered them on the galley proofs, and was not able to duplicate them afterward.

1856. Wlk., C. B. Mus., Het., IX, 159, *Hydrœcia.*
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 206, *Apamea.*
1882. Buckler, Ent. Mo. Mag., XVIII, 195, larva.
americana Speyer.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 152, an var. pr.
var. **erythrostigma** Haw.
1829. Haw., Lep. Britt., 231, *Apamea.*
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 206.
var. **lucens** Freyer.
1845. Freyer, Neue Beitr., V, 143, *Apamea.*
1852. Gn., Spec. Gen., Noct., I, 126, pr. var.
Apamea lusca Harr. MSS.
1891. Smith, List Lepidoptera, 45, pr. syn.

HABITAT.—Nova Scotia; Hudson's Bay Territory; United States generally, July and August; Europe.

The *Apamea lusca* is in the Harris collection in the Boston Society of Natural History. There seems to be no perceptible constant difference between European and American examples of this species; yet Speyer thought there was enough to authorize a variety *americana*, which was never heard of after its description.

H. erepta Grt.

1881. Grt., Bull. Geol. Surv., VI, 267, *Gortyna.*

HABITAT.—Douglas County, Kansas.

The type is in the British Museum.

H. immanis Gn.*

1852. Gn., Spec. Gen., Noct., I, 128, *Hydrœcia.*
1856. Wlk., C. B. Mus., Het., IX, 162, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 18, *Gortyna.*
1882. Dodge, Can. Ent., XIV, 93, larva on Hops.
1885. Lint., 2d Rept. Ins. N. Y., 41, larva.
obliqua Harv.
1876. Harv., Can. Ent., VIII, 53, *Gortyna.*
1881. Grt., Bull. Geol. Surv., VI, 268, *Gortyna.*
1884. Smith, Bull. 4, Div. Ent. U. S. Dept. Agl., 38, pr. syn.

HABITAT.—Northern United States, Atlantic to Pacific; New York in August; Washington; Colorado; Illinois in August and September.

Guenée's type is in the British Museum; where also there are specimens of *obliqua* Harvey, agreeing with the type in the Edwards collection. There is no reasonable doubt of their identity.

H. stramentosa Gn.

1852. Gn. Spec. Gen., Noct., I, 129, pl. 6, f. 2, *Hydrœcia.*
1856. Wlk., C. B. Mus., Het., IX, 162, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 18, *Gortyna.*

HABITAT.—Middle and Central States; New York; Illinois.

The type is in the British Museum.

H. inquæsita G. & R.*

1868. G. & R., Trans. Amer. Ent. Soc., I, 344, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 110, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 18, *Hydrœcia.*
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 206, *Apamea.*
1882. Grt., New List, 29, *Gortyna quæsita* err. type.
1882. Grt., Can. Ent., XIV, 170, *Apamea.*

HABITAT.—New York; Rhode Island; Eastern, Middle, and Central States; New Hampshire in September.

A specimen labeled by Mr. Grote is in the British Museum. I have not seen the type, and do not know where it is.

H. cerina Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 200, *Gortyna.*
1882. Grt., Ill. Essay, 59, pl. II, f. 25, *Gortyna.*

HABITAT.—Kansas; Maine.

The type is in the British Museum.

H. rigida Grt.*

1877. Grt., Can. Ent., IX, 87, *Gortyna.*
1881. Grt., Bull. Geol. Surv., VI, 269, *Gortyna.*
1882. Grt., Papilio, II, pl. 1, f. 3 and 3*a*, *Gortyna.*
1882. Grt., Ill. Essay, 58, pl. II, f. 24, *Gortyna.*

HABITAT.—New York; Massachusetts; Illinois; Maine in September.

The type is in the British Museum.

H. impecuniosa Grt.

1881. Grt., Bull. Geol. Surv., VI, 267, *Gortyna.*
1882. Grt., Can. Ent., XIV, 184, *Gortyna.*

HABITAT.—Massachusetts; New York.

The type is in the British Museum.

H. cataphracta Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 81, pl. 2, f. 3, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 111, 142, *Hydrœcia.*
1881. Grt., Bull. Geol. Surv., VI, 269, *Gortyna.*
1891. Dyar, Can. Ent., XXIII, 157, larva.

HABITAT.—Canada in September; Massachusetts; northern New York in October; Colorado.

The type should be in the collection of the American Entomological Society, but I have not found it. A specimen in the British Museum, labeled by Mr. Grote, agrees with the identification general in American collections. *Leucostigma* will be cited under *rutila.*

H. purpurifascia G. & R.

1868. G. & R., Trans. Am. Ent. Soc., I, 341, pl. 7, f. 51, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 110, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 19, *Ochria.*
1874. Grt., Can. Ent., VI, 216, *Gortyna.*
1881. Grt., Bull. Geol. Surv., VI, 269, *Gortyna.*

HABITAT.—Maine and Massachusetts in September and October; New York, August and September; Illinois; Colorado.

A specimen in the collection of the American Entomological Society, labeled by Mr. Grote, is probably the type, though not so marked.

H. rutila Gn.*

1852. Gn., Spec. Gen., Noct., I, 123, pl. VI, f. I, *Gortyna.*
1856. Wlk., C. B. Mus., Het., IX, 157, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci, I, 111, *Hydrœcia.*
1881. Grt., Bull. Geol. Surv., VI, 268, *Gortyna.*
leucostigma || Harris.
1862. Harris, Ins. Inj. to Veg., 440, *Gortyna.*
1863. Grt., Proc. Ent. Soc. Phil., II, 432, pr. syn.
1865. Grt., Proc. Ent. Soc. Phil., IV, 325, = *cataphracta.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 111, = *rutila.*
1881. Grt., Bull. Geol. Surv., VI, 268, ? = *harrisii.*

HABITAT.—Maine; Massachusetts; New York; Illinois; Colorado. The Eastern States in September.

The type is in the British Museum. It differs from the *harrisii* in the same collection by the more even s. t. line.

H. harrisii Grt.

1881. Grt., Bull. Geol. Surv., VI, 268, 276, *Gortyna.*

HABITAT.—Massachusetts; Maine in September.

The type is in the British Museum.

H. speciosissima G. & R.

1868. G. & R., Trans. Am. Ent. Soc., I, 342, pl. vii, f. 52, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 111, *Hydrœcia.*
1881. Grt., Bull. Geol. Surv., VI, 269, *Gortyna.*

HABITAT.—Rhode Island; Massachusetts in September; northern New York.

I have not seen the type of this species and have no idea where it can be.

H. marginidens Gn.*

1852. Gn., Spec. Gen., Noct., I, 123, *Gortyna.*
1856. Wlk., C. B. Mus., Het., IX, 157, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 111, *Hydrœcia.*
1881. Grt., Bull. Geol. Surv., VI, 269, *Gortyna.*

HABITAT.—Northern, Eastern, and Middle States; Illinois.

The type is in the British Museum, and is the species I have been naming *limpida* in collections, including that of the National Museum. The type of *limpida*, also in the British Museum, is very dark, almost black; but with exactly the same marking as in *marginidens*. I have no doubt the two will prove varieties, as this kind of variation is not uncommon in *Gortyna*. At all events all my *limpida* labels should be changed to read *marginidens*, as I have changed them in the National Museum

H. limpida Gn.

1852. Gn., Spec. Gen., Noct., i, 124, *Gortyna.*
1856. Wlk., C. B. Mus., Het., ix, 157, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 110, *Hydrœcia.*
1881. Grt., Bull. Geol. Surv., vi, 269, *Gortyna.*

HABITAT.—New York; Eastern and Middle States; Massachusetts in September.

The type is in the British Museum, and has been spoken of under *marginidens.*

H. cerussata Grt.

1864. Grt., Proc. Ent. Soc. Phil., ii, 431, pl. ix, f. 1, *Gortyna.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 110, *Hydrœcia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 18, = *limpida.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 216, an sp. dist.
1881. Grt., Bull. Geol. Surv., vi, 269, *Gortyna.*

HABITAT.—Pennsylvania; New York; Massachusetts in September.

The type should be in the collection of the American Entomological Society; but I have not found it there. It is undoubtedly a near relative of *limpida;* but seems distinct and at all events needs critical study before definite conclusions can be reached.

H. appasionata Harv.

1876. Harv., Can. Ent., viii, 155, *Gortyna.*

HABITAT.—London, Canada.

The type of this very distinct species is in the British Museum.

H. nitela Gn.*

1852. Gn., Spec. Gen., Noct., i, 124, *Gortyna.*
1856. Wlk., C. B. Mus., Het., ix, 158, *Gortyna.*
1869. Pack., Guide to Study Insects, 310, f. 241, *Gortyna.*
1869. Riley, 1st Rept. Ins. Mo., 92, larva.
1870. Riley, Amer. Ent., i, 22, f. 11, larva.
1872. Le Baron, 3d Rept. Ins. Ill., 141, f. 1 and 2, larva.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 111, *Hydrœcia.*
1875. Pack., 9th Ann. Rept. Geol. Surv., 719, pl. 65, f. 6, *Gortyna.*
1876. Riley, 8th Rept. Ins. Mo., 37, larva.
1878. French, 7th Rept. Ins. Ills., 221, larva.
1880. Riley, Amer. Ent., iii, 201, f. 107, *Gortyna.*
1883. Saund., Fruit Insects, 334, f. 347, 348, *larva.*
1883. Osborn, Can. Ent., xv, 174, larval habits.
1884. Lint., 1st Rept. New York State Ent., 110, f. 26, larva.

var. **nebris** Gn.*

1852. Gn., Spec. Gen., Noct., i, 124, *Gortyna.*
1856. Wlk., C. B. Mus., Het., ix, 157, *Gortyna.*
1878. Graef, Bull. Bkln. Ent. Soc., i, 7, pr. var.
1881. Riley, Papilio, i, 107, habits and var.
1881. Riley, Index and Supplt. to Mo. Repts., 56, pr. syn.

HABITAT.—Canada to Georgia, west to the Rocky Mountains; Eastern States in September.

Types of both forms are in the British Museum. I have given an unusually large, yet far from complete, economic bibliography, because I happened to have the references convenient.

H. necopina Grt.*

1876. Grt., Can. Ent., viii, 25, *Gortyna*.

HABITAT.—New York.

The type is in the British Museum and is like *nitela* save that it lacks the white, transverse line.

H. serrata Grt.

1880. Grt., No. Amer. Ent., i, 94, *Gortyna*.
1881. Grt., Bull. Geol. Surv., vi, 269, *Gortyna*.

HABITAT.—Colorado.

The type is in the Graef collection.

Genus **GORTYNA** Ochs.

1816. Ochs., Schmett. Eur., iv, 82.

G. sauzalitæ Grt.

1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 216, *Ochria*.
1875. Grt., Stett. Ent. Zeit., xxxvi, 342, *Ochria*.
1881. Grt., Bull. Geol. Surv., vi, 269, *Ochria*.
purpurifascia ‡ Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 142, *Ochria*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 216, pr. syn.

HABITAT.—California.

The type is in the British Museum, and I confess I can not see the slightest difference between it and the type of *harrisii*. There may be a clypeal modification; but I could not see it, nor could I examine closely enough to make sure it was not there. There is also a specimen of *Arzama obliquata*, marked *O. sauzalitæ*, in Mr. Grote's writing; but this is almost undoubtedly due to some accidental transposition of labels.

G. buffaloensis Grt.

1877. Grt., Can. Ent., ix, 88, *Ochria*.
1881. Grt., Bull. Geol. Surv., vi, 269, *Ochria*.

HABITAT.—Buffalo, New York.

The type is in the British Museum and has all the fascies of an *Hydrœcia*. I could not examine the clypeal structure sufficient to make out any modifications if such exist.

Genus **ACHATODES** Gn.

1852. Gn., Spec. Gen., Noct., i, 132.

A. zeæ Harris.*

1841. Harris, Ins. Inj. to Veg., 1st ed., 319, *Gortyna*.
1862. Harris, Ins. Inj. to Veg., Flint ed., 439, pl. 7, f. 9, *Gortyna*.
1864. Grt., Proc. Ent. Soc. Phil., iii, 540, *Achatodes*.

1883. Hy. Edw., Papilio III, 134, *Achatodes*.
sandix Gn.
1852. Gn., Spec. Gen., Noct. I, 132, pl. 6, f. 4, *Achatodes*.
1856. Wlk., C. B. Mus., Het., IX, 166, *Achatodes*.
1860. H. Sch., Corr. Blatt, 1863, 73, *Achatodes*.
1864. Grt., Proc. Ent. Soc. Phil., III, 540, pr. syn.

HABITAT.—Canada; Northern, Middle, Central, and Southern States; Colorado; Northern and Eastern States in July and August.

Guenée's type is in the British Museum and is correctly referred to our common species.

Genus **EUTHISANOTIA** Hbn.

1823. Hbn., Zutræge, III, 39.

E. timais Cram.*

1782. Cram., Lep. Exot., III, 148, pl. 275, *B*, *Phalæna*.
1823. Hbn., Zutræge, III, 39, No. 295, f. 589–590, *Euthisanotia*.
1816. Hbn., Verzeichniss, 211, *Xanthopastis*.
1852. Gn., Spec. Gen., Noct., I, 116, *Glottula*.
1856. Wlk., C. B. Mus., Het., IX, 142, *Euthisanotia*.
1868. H. Sch., Corr. Blatt, 1868, Ins. Cuba, 8, *Euthisanotia*.
1886. Gundlach, Cont. Ent. Cub., 303, *Euthisanotia*.
regnatrix Grt.
1863. Grt., Proc. Ent. Soc. Phil., II, 399, pl. II, f. 4, *Philochrysa*.
1863. Grt., Proc. Ent. Soc. Phil., II, 441, pr. syn.

HABITAT.—Florida; Atlantic coast, occasional to New York.

Genus **NOROPSIS** Gn.

1852. Gn., Spec. Gen., Noct., I, 117

N. hieroglyphica Cram.

1779. Cram., Pap. Exot., II, pl. 147, f. *D*. *Phalæna*.
1856. Wlk., C. B. Mus., Het., IX, 145, *Euglyphia*.
festira Fabr.
1781. Fabr., Spec. Ins., II, 194, *Bombyx*.
1787. Fabr., Mant. Ins., II, 127, 157, *Bombyx*.
1792. Fabr., Ent. Syst., III, 1, 463, *Bombyx*.
1793. Gmel., ed. XIII, Linn., Syst. Nat., I, 5, 2425, *Bombyx*.
1808. Oliv., Enc. Meth., V, 85, *Bombyx*.
1856. Wlk., C. B. Mus., Het., IX, 145, pr. syn.
elegans Hbn.
1810. Hbn., Samml. Ex. Schmett., I, Lep. IV, Noct. f. 1–4, *Diphthera*.
1816. Hbn., Verzeichniss, 203, *Euglyphia*.
1856. Wlk., C. B. Mus., Het., IX, 145, pr. syn.
fastuosa Gn.
1852. Gn., Spec. Gen., Noct., I, 117, *Noropsis*.
1856. Wlk., C. B. Mus., Het., IX, 145, pr. syn.

HABITAT.—Texas; Florida.

This is a decidedly aberrant creature for our fauna and an intruder from a Southern clime. It has been bred in Texas, however, and must, I presume, be added. The synonymy and bibliography is after Walker.

Genus **BELLURA** Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 465..

Our good friend Walker still influences our catalogues. *Bellura* was described about 200 pages before *Arzama* in the same volume, and as the types of *Bellura* and *Arzama* are the same species, the former will have to be used, even though it was placed in the Bombycidæ and was said to be related to *Datana*.

B. gortynides Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 465, *Bellura*.
densa Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 645, *Arzama*.
1868. H. Sch., Corr. Blatt, 1868, Ent. Cub., 16, *Arzáma*.
1868. G. & R., Trans. Am. Ent. Soc., I, 340, *Arzama*.
1886. Gundlach, Cont. Ent. Cub., 325, *Arzama*.
vulnifica Grt.
1872 Grt., Trans. Am. Ent. Soc., IV, 294, *Arzama*.
melanopyga Grt.
1881. Grt., Papilio, I, 148, *Arzama*.
1881. Comstock, Papilio, I, 148, larva in lily.

HABITAT.—Canada, southward to Florida; west to the Mississippi States.

The types of Walker's species are in the British Museum, which also contains specimens of Mr. Grote's species not marked type. Where the original types are I can not say. Prof. Comstock may have that of *melanopyga*. Walker's species are exactly alike save as to degree of imperfection, and I can not make anything different out of *vulnifica*. The characters given by Mr. Grote for *melanopyga* are very feeble and are evanescent in character, a fact which he has realized to the extent of citing it a variety in his revised list of 1890.

B. diffusa Grt.

1878. Grt., Bull. Geol. Surv., IV, 179, *Arzama*.

HABITAT.—Canada; Maine.

I have not seen the type of this species.

B. obliqua Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 428, *Edema*.
1882. Grt., Ill. Essay, 42, = *Sphida obliquata*.
obliquata G. & R.
1868. G. & R., Trans. Am. Ent. Soc., I, 339, pl. 6, f. 47, *Arzama*.
1878. Grt., Bull. Geol. Surv., IV, 179, *Sphida*.
1878. Worth., Can. Ent., X, 15, larva.
1883. Grt., Proc. Am. Phil. Soc., XXI, 157, *Sphida*.
1883. Kellicott, Can. Ent., XV, 174, larval habit.
1883. Riley, Can. Ent., XV, 176, larval habit.
1888. Brehme, Can. Ent., XX, 119, life history.
1889. Kellicott, Can. Ent., XXI, 39, larva.
1889. Brehme, Can. Ent., XXI, 78, larval habits.

1889. Johnston, Can. Ent., XXI, 79, larval habits.
1889. Moffat, Can. Ent., XXI, 99, larva.
1889. Beutenmueller, Can. Ent., XXI, 160, larva.

HABITAT.—Canada in July; south to Florida, west to the Mississippi Valley; Colorado; Massachusetts in June; New Jersey in October, May and June.

Walker's type is in the British Museum. Mr. Grote's is in the Collection American Entomological Society. They are identical, as Mr. Grote has already stated.

Genus **NONAGRIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 82.

N. permagna Grt.

1883. Grt., Papilio, III, 73, *Nonagria*.

HABITAT.—Indian River, Florida.

The type is in Mr. Neumœgen's collection.

N. laeta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 120, *Nonagria*.
1882. Grt., Papilio, II, 95, *Nonagria*.

HABITAT.—Hoboken, New Jersey.

I have not seen the type of this species and do not know where it is. I am distinctly suspicious of species of about that date, said to have been taken at Hoboken, New Jersey. There were one or two collectors at that place who distributed extra limital species without locality labels, asserting that they were from that region. Most of them were soon detected; but I believe it will be found that Mr. Morrison has described at least two of them.

N. subflava Grt.*

1882. Grt., Papilio, II, 95, *Nonagria*.
1882. Grt., Bull. Geol. Surv., VI, 583, *Nonagria*.

HABITAT.—Illinois; Massachusetts; Maine.

I have not seen the type, which may be with Dr. Thaxter.

N. oblonga Grt.

1882. Grt., Papilio, II, 96, *Nonagria*.

HABITAT.—Kittery Point, Maine.

The type is probably with Dr. Thaxter.

N. subcarnea Kellicott.*

1883. Kellicott, Can. Ent., XV, 175, *Nonagria*.
1884. Kellicott, Bull. Bkln. Ent. Soc., VII, 86, *Nonagria*.
1884. Kellicott, Can. Ent., XVI, 170, *Nonagria*.
1885. Kellicott, Bull., Buff. Soc, Nat. Sci., V, 40, *Nonagria*.

HABITAT.—Buffalo, New York.

The types are with Dr. Kellicott.

N. inquinata Gn.

1852. Gn., Spec. Gen., Noct., I, 104, *Nonagria*.
1856. Wlk., C. B. Mus., Het., IX, 128, *Nonagria*.
1882. Grt., Papilio, II, 94, *Nonagria*.

HABITAT.—New York.

This species should be in the British Museum, but I failed to find it. In view of the fact that both of the other species are referable to *Senta*, rather than *Nonagria*, it is not unlikely that Guenée had before him something very like *S. defecta* Grt. The small size—21 mm., would favor this view; but it will need more material than I have at command at present to decide this.

Genus **SENTA** Steph.
1829. Steph., Ill. Br. Ent., Haust., III, 279.

S. defecta Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 29, *Senta*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. I, f. 4, *Senta*.

HABITAT.—Massachusetts; New York; Maryland; Eastern, Middle, and Central States.

The type is in the British Museum. I believe this may be found to be the *Nonagria inquinata* of Guenée.

S. enervata Gn.

1852. Gn., Spec. Gen., Noct., I, 105, *Nonagria*.
1856. Wlk., C. B. Mus., Het., IX, 128, *Nonagria*.
1882. Grt., Papilio, II, 95, *Nonagria*.
fodiens Gn.
1852. Gn., Spec. Gen., Noct., I, 105, *Nonagria*.
1856. Wlk., C. B. Mus., Het., IX, 128, *Nonagria*.
1882. Grt., Papilio, II, 95, *Nonagria*.

HABITAT.—Florida.

The types are in the British Museum and are sexes of the same species. They are not congeneric with *Nonagria typhae*; but appear to be congeneric with *Senta defecta*. The body is quite robust, the eyes are naked, front smooth, without tubercle, and the male antennae simple. In color the specimens are blackish, with little or no ornamentation. I never saw the like of them before.

Genus **POTA** Grt.
1882. Grt., Can. Ent., XIV, 174.

P. armata Grt.

1882. Grt., Can. Ent., XIV, 175 [illegible] *Pota*.
1883. Grt., Proc. Am. Phil. [illegible] *Pota*.

HABITAT.—Arizona.

P. [illegible] Grt.

1882. Grt., Can. Ent., XIV, [illegible] *Pota*.
1883. Grt., Proc. Am. Phil. [illegible] *Pota*.

HABITAT.—Arizona.

Both of the above species are [illegible] of Mr. [illegible] lection, and Mr. Grote gave me types of each, which are now in the National Museum. The genus has little in common with those with which it is associated; but I leave it where Mr. Grote put it until critical study develops a better place for it.

Genus **PLATYSENTA** Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., 28.

P. videns Gn.*

1852. Gn., Spec. Gen., Noct., I, 78, *Leucania*.
1882. Grt., Ill. Essay, 42, = *atriciliata*.
indigens Wlk.
1857. Wlk., C. B. Mus., Het., XI, 712, ? *Nonagria*.
1882. Grt., Ill. Essay, 42, pr. syn.
meskei Speyer.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 116, *Caradrina*.
1882. Grt., New List, 30, ? pr. syn.
atriciliata Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., 28, *Platysenta*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. I, f. 2, *Platysenta*.

HABITAT.—Massachusetts in June and July, to Florida, west to the Mississippi Valley; Colorado; Illinois in August; District of Columbia in July, August, and September.

Guenée's type is in the British Museum, and is unquestionably the same as Mr. Grote's species. Walker's type I did not see, but Mr. Grote did, and is positive in referring it to *atriciliata*. I made a regrettable error in identifying *Monodes nucicolora* Gn., with this species.

P. angustiorata Grt.*

1882. Grt., Bull. Geol. Surv., VI, 584, *Platysenta*.

HABITAT.—Colorado.

Mr. Grote gave me a specimen marked type, which is now in the National Museum.

Genus **TAPINOSTOLA** Led.

1857. Lederer, Noct. Eur., 123.

T. variana Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 432, *Tapinostola*.

HABITAT.—Detroit, Michigan.

The type should be, and probably is, in the Museum of Comparative Zoölogy at Cambridge; but I did not see it there.

T. orientalis Grt.

1882. Grt., Bull. Geol. Surv., VI, 583, *Tapinostola*.

HABITAT.—Kittery Point, Maine; Buffalo, New York.

I have seen the type specimens in Dr. Thaxter's collection, and have identified the species from Buffalo, New York. Dr. Thaxter thought it probably a variety of *variana*. Mr. Neumœgen also has a "type."

Genus **OMMATOSTOLA** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., II, 112.

O. lintneri, Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., II, 112, *Ommatostola.*

HABITAT.—New York; Anglesea, New Jersey.

Types are in Dr. Lintner's collection and in the British Museum.

Genus **LEUCANIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 81.

L. pallens Linn.*

1761. Linn., Fauna Suec., 1175, *Noctua.*
1767. Linn., Syst. Nat., ed. XII, ii, 838, *Noctua.*
1759. Clk., Icones, t. 4, f. 6, *Phalæna.*
1781. Fabr., Spec. Ins., II, 214, *Noctua.*
1787. Fabr., Mant. Ins., II, 139, *Noctua.*
1816. Hbn., Verzeichniss, 241, *Leucania.*
1852. Gn., Spec. Gen., Noct., I, 92, *Leucania.*
1856. Wlk., C. B. Mus., Het., IX, 91, *Leucania.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 112, *Leucania.*

HABITAT.—Canada; United States generally, except Southern States, June to September.

The bibliography of older and European authors is incomplete and reference should be had to Staudinger and Walker for other citations. In American literature I have found nothing worthy of remark. I have seen this species, or something very closely allied to it, from California.

L. oxygale Grt.*

1881. Grt., Can. Ent., XIII, 14, *Heliophila.*

HABITAT.—Colorado.

The type is in the British Museum. I have a specimen carefully compared with it. Another specimen, also marked type, is in the Tepper collection.

L. prægracilis Grt.

1877. Grt., Bull. Geol. Surv., III, 119, *Heliophila.*

HABITAT.—Idaho, July 6; Colorado; New Mexico.

I have not seen the type of this species, and do not know certainly where it is. In the Cambridge collection is a specimen marked *Heliophila gracillima* type; but I find no such species described. Is it possible that Mr. Grote's description was intended for this insect? It is not unlikely, for the description applies fairly well. Mr. Thaxter has marked it "*bicolorata*" and the two are very nearly related if not identical.

L. bicolorata Grt.

1881. Grt., Papilio, I, 154, *Heliophila.*

HABITAT.—Tucson, Arizona; Colorado; New Mexico.

The type is with Mr. Neumœgen, and is, as already suggested, a close ally of the preceding.

L. patricia Grt.

1880. Grt., Bull. Bkln. Ent. Soc., III, 46, *Heliophila*.

HABITAT.—Colorado; Las Vegas, New Mexico.

The type is in the Tepper collection. Mr. Meeske collected it in some numbers at Las Vegas, New Mexico. It does not look like *Leucania* at first sight, from its slender form and the clear white median stripe.

L. pertracta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 120, *Heliophila*

HABITAT.—Pennsylvania.

The type is in Mr. Strecker's collection.

L. rubripennis G. & R.*

1870. G. & R., Trans. Am. Ent. Soc., III, 179, pl. 2, f. 77, *Leucania*.

HABITAT.—Texas in August.

A specimen marked "Type" is in the British Museum.

L. rufostriga Pack.

1866. Pack., Proc. Bost. Soc. N. H., XI, 36, *Leucania*.

HABITAT.—Caribou Island; Labrador.

The type is probably in the Cambridge collection. I have no note of seeing it while at Salem; but the material was then in such a confused shape that it was easy to overlook specimens.

L. albilinea Hbn.*

1816. Hbn., Samml. Ex. Schmett., 25, ff., 337, 338.
1816. Hbn., Verzeichniss, 241, *Leucania*.
1852. Gn., Spec. Gen., Noct., I, 89, *Leucania*.
1856. Wlk., C. B. Mus., Het., IX, 99, *Leucania*.
1877. Riley, 9th Rept. Ins. Mo., 50, f., 14, 15, all stages.
1880. Grt., Can. Ent., XII, 116, *Leucania*.
diffusa Wlk.
1856. Wlk., C. B. Mus., Het., IX, 94, *Leucania*.
1882. Grt., Ill. Essay, 42, pr. syn.
moderata Wlk.
1856. Wlk., C. B. Mus., Het., IX, 114, *Leucania*.
harveyi Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 9, pl. I, f. 14, *Leucania*.
1876. Harv., Bull. Buff. Soc. Nat. Sci., III, 8, *Leucania*.
1880. Grt., Can. Ent., XII, 116, an sp. dist. ?

HABITAT.—Nova Scotia; Canada, in August; United States east of the Rocky Mountains; Northern and Middle States in August; Texas in March and April; Colorado; New Mexico.

The types of *diffusa*, *moderata*, and *harveyi* are all in the British Museum, and all refer to *albilinea*, or what Guenée has identified as such—correctly, I think. The economic bibliography is large.

L. ligata Grt.*

1875. Grt., Trans. Am. Ent. Soc., v, 115, *Heliophila*.
1879. Strk., Rept. Chief Eng., 1878–'79, v, p. 1862, *Leucania*.

HABITAT.—Texas in March to November; Colorado, July 31; Florida in March.

The type is in the British Museum.

L. dia Grt.*

1879. Grt., Can. Ent., xi, 29, *Heliophila*.
1882. Grt., Ill. Essay, 56, pl. ii, f. 19, *Heliophila*.

HABITAT.—California.

The type is in the Bailey collection.

L. extincta Gn.

1852. Gn., Spec. Gen., Noct., i, 79, *Leucania*.
1856. Wlk., C. B. Mus., Het., ix, 94, *Leucania*.
linita Gn.
1852. Gn., Spec. Gen., Noct., i, 81, *Leucania*.
1856. Wlk., C. B. Mus., Het., ix, 95, *Leucania*.
1891. Smith, List Lepidoptera, 46, pr. syn.
scirpicola Gn.
1852. Gn., Spec. Gen., Noct., i, 84, *Leucania*.
1856. Wlk., C. B. Mus., Het., ix, 96, *Leucania*.
1891. Smith, List Lepidoptera, 46, pr. syn.
amygdalina Harv.*
1878. Harv., Can. Ent., x, 57, *Heliophila*.

HABITAT.—Maine to Texas; Florida.

All the types are in the British Museum and without any question refer to one species only. *Insueta*, on the other hand, is a distinct species.

L. multilinea Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 97, *Leucania*.
1875. Grt., Proc. Ac. Nat. Sci., 1875, 419, = *commoides*.
lapidaria Grt.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 419, *Heliophila*.

HABITAT.—Canada; New York in July and August.

Both types are in the British Museum and refer to the same species. Mr. Grote referred *multilinea* as a synonym of *commoides* on the faith of a specimen determined by Walker in a Canadian collection; but Walker's determinations, even of his own species, are absolutely untrustworthy.

L. phragmatidicola Gn.*

1852. Gn., Spec. Gen., Noct., i, 89, *Leucania*.
1856. Wlk., C. B. Mus., Het., ix, 97, *Leucania*.
var **texana** Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 211, *Heliophila*.

HABITAT.—Canada in August, to Texas; United States east of the Rocky Mountains; Colorado; New Mexico; Texas, March, April, July, September, October; New York in June to September.

The type of the species is in the British Museum and I have a carefully compared specimen. I have not seen Mr. Morrison's variety, which may be another species, probably represented in the National Museum.

L. juncicola Gn.*

1852. Gn., Spec. Gen., Noct., I, 83, *Leucania*.
1856. Wlk., C. B. Mus., Het., IX, 96, *Leucania*.
adjuta Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 158, *Heliophila*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 8, *Heliophila*.

HABITAT.—Alabama; Texas in March.

Mr. Grote's type is in the British Museum, where there is also a specimen named *juncicola*, apparently determined by Guenée. Guenée credits the species to Boisduval, but describes it himself for the first time. The specimen agrees well with the description and may, I think, be fairly considered as representative of *juncicola* which, then, is the same as *adjuta*.

L. farcta Grt.

1881. Grt., Can. Ent., XIII, 15, *Heliophila*.

HABITAT.—California.

The type is in the British Museum. I have a compared specimen almost exactly like it.

L. insueta Gn.*

1852. Gn., Spec. Gen., Noct., I, 81, *Leucania*.
1856. Wlk., C. B. Mus., Het., IX, 95, *Leucania*.
1877. Grt., Can. Ent., IX, 28, = *commoides*.
adonea Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 159, *Heliophila*.

HABITAT.—Nova Scotia; Canada in July; New York, June to August; Colorado.

Both the types are in the British Museum and refer to the same species. *Insueta* is a somewhat darker form; but not otherwise different. Mr. Grote's reference to *commoides* was based on determinations made by Walker, and that was a very unsafe basis. I have specimens compared with the types.

L. commoides Gn.*

1852. Gn., Spec. Gen., Noct., I, 86, *Leucania*.
1856. Wlk., C. B. Mus., Het., IX, 96, *Leucania*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 113, *Leucania*.

HABITAT.—Nova Scotia; Canada; New York, June to August; Wisconsin; Minnesota; Illinois; Colorado; New Mexico; Florida in March.

The type is in the British Museum and is the species so named in American collections.

L. flabilis Grt.

1881. Grt., Can. Ent., XIII, 15, *Heliophila.*

HABITAT.—Long Island, New York.

Types are in the Tepper collection and in the British Museum. The species was described from material taken by Mr. Tepper.

L. rimosa Grt.*

1882. Grt., Can. Ent., XIV, 216, *Heliophila.*

HABITAT.—Kittery Point, Maine.

The type is with Dr. Thaxter.

L. unipuncta Haw.*

1810. Haw., Lep. Britt., II, 177, *Noctua.*
1829. Steph., Ill. Brit. Ent., Haust., III, 80, *Noctua.*
1862. Flint, in Harris, Inj. Ins., 627, f. 274, 275, 276, *Leucania.*
1864. Grt., Proc. Ent. Soc. Phil., III, 540, *Leucania.*
1870. Riley, 2d Rept. Ins. Mo., 37, ff. 11, 14–16, *Leucania.*
1871. Riley, Amer. Ent., I, 215, ff. 152–154, *Leucania.*
1876. Riley, 8th Rept. Ins. Mo., 22, 184, 215, *Leucania.*
1883. Riley, 3d Rept. U. S. Ent. Comm., 89–156, *Leucania.*
extranea Gn.
1852. Gn., Spec. Gen., Noct., I, 77, *Leucania.*
1856. Wlk., C. B. Mus., Het., IX, 93, *Leucania.*

HABITAT.—Canada to Florida and Texas, west to the Rocky Mountains; Colorado; New Mexico; throughout the season.

For the full bibliography of this insect to 1881, reference should be had to the Third Report of the U. S. Entomological Commission, where more than eight pages of titles are given. Were the bibliography since that time collected with equal completeness it would fill eight pages more.

L. subpunctata Harv. *

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 8, *Heliophila.*

HABITAT.—Texas in March.

The type is in the British Museum. I have a specimen carefully compared with it.

L. pilipalpis Grt.

1875. Grt., Proc. Bost. Soc. N. H., XVIII, 415, *Heliophila.*

HABITAT.—Apalachicola, Florida.

I have seen the type in Dr. Thaxter's collection. It is a peculiar and very distinct species, which I have not had since.

L. pseudargyria Gn.*

1852. Gn., Spec. Gen., Noct., I, 74, *Leucania.*
1856. Wlk., C. B. Mus., Het., IX, 77, *Mythimna.*
1874. Caulfield, Can. Ent., VI, 132, *Leucania*, larva.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 113, *Leucania.*
1881. French, Can. Ent., XIII, 24, larva.

var **obusta** Gn.

1852. Gn., Spec. Gen., Noct., I, 74, *Leucania.*
1856. Wlk., C. B. Mus., Het., IX, 77, *Mythimna.*
1882. Grt., Ill. Essay, 40, ? pr. syn.
callida Grt.
1882. Grt., New List, 30, in note, var. pr.

HABITAT.—Canada in July and August to Texas; east of Rocky Mountains; Colorado; New Jersey in April and June; New York, May to August.

Guenée's types are in the British Museum. *Obusta* is undoubtedly the red form of *pseudargyria*, and just exactly what Mr. Grote named *callida*.

L. ebriosa Gn.

1852. Gn., Spec. Gen., Noct., I, 74, pl. 3 f. 1, *Leucania.*
1856. Wlk., C. B. Mus., Het., IX, 70, *Mythimna.*
1882. Grt., Ill. Essay, 40, *Mythimna.*

HABITAT.—"Am. Sept."

A curious species to be an American insect. The eyes are hairy, antennæ serrate and bristled, "brush-like," the wings short, resembling *Scopelosoma*, color carmine red. If from America at all, it is probably from Florida, of Doubleday's material.

Genus **ZOSTEROPODA** Grt.

1874. Grt., Bull. Buff. Nat. Sci., II, 67.

Z. hirtipes Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 68, *Zosteropoda.*
1875. Grt., Can. Ent., VII, 25, *Zosteropoda.*
1882. Grt., Ill. Essay, 56, pl. 2, f. 20, *Zosteropoda.*

HABITAT.—California, March, April, July, and September.

A type is in the Edwards collection. Another is in the British Museum.

Genus **UFEUS** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 101.

U. sagittarius Grt.

1883. Grt., Papilio, III, 31, *Ufeus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 170, *Ufeus.*

HABITAT.—California.

The type is in the Neumoegen collection.

U. plicatus Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 102, *Ufeus.*
1873. Grt., Proc. Bost. Soc. Nat. Hist., XVI, 241, *Ufeus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 170, *Ufeus.*

HABITAT.—Canada; Pennsylvania; Colorado; California.

The type should be in the collection of the American Entomological Society, but I have not found it there.

U. unicolor Grt.*

1878. Grt., Bull. Geol. Surv., IV, 179, *Ufeus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 170, *Ufeus.*

HABITAT.—Illinois; Colorado.

Th [illegible] in the British Museum.

U. satyricus Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 101, pl. 3, f. 4, *Ufeus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 170, *Ufeus.*

HABITAT.—Canada in July; New York; Pennsylvania; Illinois, February.

The type is in Dr. Lintner's collection.

Genus **PTEROSCIA** Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 155.

P. atrata Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 156, *Pteroscia.*

HABITAT.—Mount Washington, N. H., July 5 and 7.

The type is in the British Museum from the Grote collection. It is a roughly clothed, dull, smoky-brown species, with broad wings and simple male antennæ. The only obvious marking is a dentate, pale, exterior transverse line. I had not seen it before.

Genus **SCOLECOCAMPA** Gn.
1852. Gn., Spec. Gen., Noct., I, , 131.

S. liburna Geyer.*

1823. Geyer, Zutræge, 482, ff. 963. 964, *Clytie.*
1858. Wlk., C. B. Mus., Het., XIV, 1364, *Pseudophia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 20, *Scolecocampa.*
1875. Grt., Proc. Bost. Soc. N. H., XVIII, 415, *Scolecocampa.*
1881. Grt., Can. Ent., XIII, 91, *Scolecocampa.*
1883. Hy. Edw., Papilio, III, 134, larva.
ligni Gn.
1852. Gn., Spec. Gen., Noct., I, 131, pl. 6, f. 3. *Scolecocampa.*
1856. Wlk., C. B. Mus., Het., IX, 166, *Scolecocampa.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 20, pr. syn.

HABITAT.—Canada to Florida; east of the Rocky Mountains; Eastern and Northern States, in July.

The larva lives in decaying chestnut and oak stumps, and the range given embraces only such portions of it as afford the food plants. Guenée's types are at the Jardin des plantes and in the Boisduval collection with M. Oberthür. I did not see the specimen in the Paris Museum.

Genus **EUCALYPTERA** Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 104,

E. bipuncta Morr.*

1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 104, *Eucalyptera.*
1878. Grt., Bull. Geol. Surv., IV, 179, *Scolecocampa.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Scolecocampa.*
1882. Smith, Bull. Bkln. Ent. Soc., V, 6, *Eucalyptera.*
1883. Smith, Can. Ent., XV, 230, *Eucalyptera.*

HABITAT.—Massachusetts to Florida, along the coast.

The type is in the Tepper collection.

E. obscura Grt.

1883. Grt., Can. Ent., xv, 7, *Scolecocampa.*
1890. Grt., Revised Check List, 22, *Eucalyptera.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **DORYODES** Gn.

1857. Gn., Spec. Gen., Phal., II, 233.

D. bistrialis Geyer.*

1823. Geyer, Zutræge, 388, ff. 775, 776, *Agriphila.*
1878. Grt., Bull. Geol. Surv., IV, 179, *Doryodes.*
1881. Grt., Can. Ent., XIII, 91, *Doryodes.*
acutaria H-Sch.
1856. H-Sch., Lep. Ex., Suppl., 74, f. 447, *Ligia.*
1857. Gn., Spec. Gen., Phal., II, 233, pl. 17, f. 6, *Doryodes.*
1858. Wlk., C. B. Mus., Het., XVI, 73, ‡ *D. acutalis.*
1860. Clem., Proc. Ac. Nat. Sci. Phil., 1860, 251, *Doryodes.*
1878. Grt., Bull. Geol. Surv., IV, 179, pr. syn.
dirisa Wlk.
1863. Wlk., C. B. Mus., Het., XXVII, 187, *Thermma.*
promptella Wlk.
1863. Wlk., C. B. Mus., Het., XXVII, 196, *Tunza.*

HABITAT.—Eastern, Middle, and Western States; Florida; Maine and Massachusetts, in August; Kansas in September.

The Walker types are in the British Museum, and were described as Crambids, while Guenée considered the species Geometrid.

D. spadaria Gn.

1857. Gn., Spec. Gen., Phal., II, 234, *Doryodes.*
1862. Wlk., C. B. Mus., Het., XXIV, 1148, *Doryodes.*

HABITAT.—Florida.

I have not seen the type; nor have I made any effort to identify the species.

Genus **PHIPROSOPUS** Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 90.

P. callitrichoides Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 90, *Phyprosopus.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, *Sudariophora.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 29, *Sudariophora.*
1876. Grt., Can. Ent., VIII, 205, *Phiprosopus.*
acutalis ‡ Wlk.
1858. Wlk., C. B. Mus., Het., XVI, 73, *Doryodes.*
1872. Grt., Trans. Am. Ent. Soc., IV, 91, pr. syn.
nasutaria Zell.
1872. Zell., Verh. k. k. Zoöl.-bot. Ges., 1872, 490, t. 2, f. 11, *Sudariophora.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, pr. syn.

HABITAT.—New York to Texas, in May.

Mr. Grote's type is in the British Museum, and so, probably, is Zeller's, though I did not see the latter. Mr. Grote was quite correct in citing Walker's *acutalis* to this species.

Genus **AMOLITA** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 158.

A. fessa Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 158, *Amolita*.

HABITAT.—Massachusetts, in July, to Texas; Colorado; District of Columbia, in June; Florida, in March.

The type is in the British Museum.

Genus **CILLA** Grt.

1880. Grt., No. Am. Ent., i, 100.

C. distema Grt.*

1880. Grt., No. Am. Ent., i, 100, *Cilla*.

HABITAT.—Texas, May to August.

The type is in the British Museum.

Genus **BALSA** Wlk.

1860. Wlk., Can. Nat. and Geol., v, 250.

B. malana Fitch.*

1856. Fitch, 1st and 2d Rept. Ins. N. Y., 244, pl. iii, f. 5, *Brachytænia*.
1872. Zell., Verh. k. k., Zoöl.-bot. Ges., xxii, 454, *Nola*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 169, *Nolophana*.
1883. Saund., Fruit Insects, 101, f. 98, larva.
1883. Grt., Proc. Am. Phil. Soc., xxi, 159, *Nolophana*.
obliquifera Wlk.
1860. Wlk., Can. Nat. and Geol., v, 251, *Balsa*.
1877. Grt., Can. Ent., ix, 29, pr. syn.

HABITAT.—Canada, in July, to Georgia; Wisconsin; Central States; New York, in June to August.

Mr. Grote in Can. Ent., ix, 29, cites *Balsa obliquifera* Wlk., as a synonym of this species after an examination of the type in the collection of the Entomological Society of Ontario. Mr. Walker has thus given us three generic names for this genus—*Balsa*, *Gargaza*, and *Cutina*, all of which antedate *Nolophana* Grote.

B. triquetrana Fitch.

1856. Fitch, 1st and 2d Rept. Ins. N. Y., 244, *Brachytænia*.
1872. Zell., Verh. k. k. Zoöl.-bot. Ges., xxii, 457, *Nola*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 169, *Nolophana*.

HABITAT.—Middle States.

B. tristrigella Wlk.*

1865. Wlk., C. B. Mus., Het., xxxv, 1734, *Gargaza*.
zelleri Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 169, *Asisyra*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 159, *Nolophana*.
malana ‡ Zell.
1872. Zell., Verh. k. k. Zoöl.-bot. Ges., xxii, 454, *Nola*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 169, =*zelleri*.

HABITAT.—Massachusetts in April and May; New York, in June and August, to Texas.

Walker's type is in the British Museum. In the Grote collection are three specimens labeled *zelleri* by Mr. Grote, not types, which agree with the type of *tristrigella*. The locality of the latter is "unknown."

B. labecula Grt.

1880. Grt., Can. Ent., XII, 217, *Nolophana*.

HABITAT.—New York to Texas.

The type is in the British Museum.

Genus CATABENA Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 631.

C. lineolata Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 631, *Catabena*.
miscellus Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 181, *Adipsophanes*.
1880. Coquillett, No. Amer. Ent., I, 52, larva.

HABITAT.—Canada in May and July; New York in May and July, to California in May and July.

Both the types are in the British Museum, and refer to the same species. Walker's species was given as "locality unknown."

C. terminellus Grt.

1883. Grt., Can. Ent., XV, 132, *Adipsophanes*.

HABITAT.—Texas.

The type is with Mr. Neumœgen.

Carvanca trisecta Wlk., which is interpolated here in my List of *Lepidoptera*, is *Crambus interminellus* Wlk. Both the types are in the British Museum.

Belonging here, and probably a species of *Nolophana*, is *Cutina albopunctella* Wlk., C. B. Mus., XXXV, 1735, 1866, described as a Pyralid. The species is the generic type, and the description as applied to the specimen is a wonderful production. While I feel quite certain that the specimen is a *Nolophana* or *Balsa*, I would not dare to risk a guess at the species at present.

Genus CRAMBODES Gn.

1852. Gn., Spec. Gen., Noct., II, 152.

C. talidiformis Gn.*

1852. Gn., Spec. Gen., Noct., II, 152, pl. 7, f. 12, *Crambodes*.
1857. Wlk., C. B. Mus., Het., XI, 661, *Crambodes*.
1879. Coquillett, No. Amer. Ent., I, 5, larva.
1883. Hy. Edw., Papilio, III, 135, larva.
conjugens Wlk.
1856. Wlk., C. B. Mus., Het., IX, 119, *Carvanca*.
1865. Wlk., C. B. Mus., Het., XXXIII, 762, pr. syn.

HABITAT.—Canada in May, June, and July; Northern, Eastern, Middle, and Central States May to July; Colorado.

The types are in the British Museum. Walker has himself referred his species to the synonymy. His *Carvanca trisecta*, C. B. Mus., Het., IX, 119, is *Crambus interminellus*, also described by him.

Genus **FOTELLA** Grt.

1882. Grt., Can. Ent., XIV, 181.

F. notalis Grt.

1882. Grt., Can. Ent., XIV, 181, *Fotella*.

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

Genus **CARADRINA** Ochs.

1816. Ochs., Schmett. Eur., IV, 80.

C. tarda Gn.

1852. Gn., Spec. Gen., Noct., I, 243, *Caradrina*.
1856. Wlk., C. B. Mus., Het., X, 292, *Caradrina*.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 121, *Caradrina*.

HABITAT.—"North America;" West Virginia.

Guenée's species was described from Boisduval's collection, and the type is now with M. Oberthür, at Rennes. The specimen identified by Mr. Morrison is in the Meyer collection, where I have probably seen it without noting. I can not say, of course, whether the identification is correct.

C. miranda Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 11, 169, *Caradrina*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 114, *Caradrina*.

HABITAT.—Middle and Central States June to August; Colorado; Utah in June; California in July.

I have not seen the type. The specimens in the British Museum, though from the Grote collection, have no type label.

C. meralis Morr.

1875. Morr., Can. Ent., VII, 215, *Caradrina*.
bilunata Grt.
1877. Grt., Can. Ent., IX, 199, *Caradrina*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 39, pr. syn.
1880. Grt., Can. Ent., XII, 187, pr. syn.

HABITAT.—Northern and Eastern States; Maine; Massachusetts; New Mexico.

The type of *meralis* is in the Tepper collection; that of *bilunata* is with Dr. Thaxter.

C. derosa Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 121, *Caradrina*.

HABITAT.—New Jersey.

The type is in the Tepper collection. I have not recognized it among the material taken by the New Jersey collectors.

C. multifera Wlk.*

1856. Wlk., C. B. Mus., Het., x, 293, *Caradrina.*
1869. Beth., Can. Ent., I, 85, *Caradrina.*
fidicularia Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 145, *Segetia.*
1876. Grt., Can. Ent., VIII, 188, = *cubicularis.*
1878. Lintner, Ent. Cont., IV, 89, *Caradrina* dist. *cubicularis.*
1882. Grt., Ill. Essay, 46, pr. syn.

HABITAT.—Nova Scotia; Canada in July and August; Maine; New York, August, September; New Jersey; District of Columbia; Illinois; Minnesota.

Walker's type is in the British Museum and is our common form. Mr. Morrison's type I have not seen, nor do I know where it is. Dr. Lintner, in 1878, writes as though from a positive identification of Morrison's species, and I have no doubt the reference is correct.

C. subaquila Harv.

1878. Harv., Can. Ent., x, 57, *Caradrina.*

HABITAT.—Texas.

The type is in the British Museum.

C. conviva Harv.*

1874. Harv., Can. Ent., VIII, 6, *Caradrina.*

HABITAT.—Texas in November.

The type is in the British Museum.

C. fragosa Grt.

1883. Grt., Papilio, III, 76, *Caradrina.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

C. extimia Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 687, *Caradrina.*
cirica Grt.
1883. Grt., Papilio, III, 71, *Caradrina.*

HABITAT.—Colorado; California; Vancouver; Oregon.

Walker's type is in the British Museum and Mr. Grote's is in the Neumœgen collection. They are specifically identical.

Genus AMPHIPYRA Ochs.

1816. Ochs., Schmett. Eur., IV, 70.

I follow Staudinger and the continental entomologists generally in using *Amphipyra* instead of *Pyrophila* Hbn., Verzeichniss, 208. Though bearing date the same year, 1816, Hübner's book was not published until 1818 at least, and as both are catalogue names the earliest must d. The Tentamen, of course, is not considered in this argument.

A. tragopoginis Linn.*

1761. Linn., Fn. Suec., 1189, *Noctua*.
1767. Linn., Syst. Nat., ed. XII, 855, *Noctua*.
1781. Fabr., Spec. Ins., II, 273, *Noctua*.
1787. Fabr.. Mant. Ins., II, 177, *Noctua*.
1793. Fabr., Ent. Syst., III, 2, 112, *Noctua*.
1793. Gmel., ed. XIII, Linn. Syst. Nat., V, 2573, *Noctua*.
1800. Hbn., Eur. Schmett., IV, t, 8, f. 40, *Noctua*.
1816. Hbn., Verzeichniss, 209, *Scotophila*.
1825. Tr., Schmett. Eur., V, 277, *Amphipyra*.
1852. Gn., Spec. Gen., Noct., II, 415, *Amphipyra*.
1858. Wlk., C. B. Mus., Het., XIII, 1017, *Amphipyra*.
1870. Beth., Can. Ent., II, 73, *Amphipyra*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, *Pyrophila*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 168, *Amphipyra*.
repressus Grt.
1871. Grt., Can. Ent., III, 192, *Agrotis*.
1871. Saund., Can. Ent., III, 193, larva.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, pr. syn.

HABITAT.—Canada to Pennsylvania, west to the Mississippi; July nd August.

A. glabella Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 153, *Pyrophila*.
1878. Grt., Bull. Geol. Surv., IV, 180, *Pyrophila*.

HABITAT.—Pennsylvania; Illinois; Arizona; Nebraska; California; olorado.

I do not know where the type is to be found at present.

A. triquetra Grt.

1883. Grt., Papilio, III, 78, *Pyrophila*.

HABITAT.—Arizona.

The type is with Mr. Neumoegen.

A. pyramidoides Gn.*

1852. Gn., Spec. Gen., Noct., II, 413, *Amphipyra*.
1857. Wlk., C. B. Mus., Het., XIII, 1018, *Amphipyra*.
1864. Grt., Proc. Ent. Soc. Phil., III, 86, *Amphipyra*.
1871. Riley, 3d Rept. Ins. Mo., 72, f. 31, 32, larva.
1871. Riley, Am. Ent., II, 26, f. 23, *Amphipyra*.
1874. Saund., Can. Ent., VI, 27, larva.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, *Pyrophila*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 168, *Amphipyra*.
1875. Saund., Can. Ent., VII, 14, *Amphipyra*.
1875. Thaxter, Psyche, I, 106, *Pyrophila*.
1875. Riley, Psyche, I, 152, *Amphipyra*.
var. **inornata** Grt.
1864. Grt., Proc. Ent. Soc. Phil., III, 86, *Amphipyra*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, pr. var.
ab. **conspersa** Riley.
1871. Riley, 3d Rept. Ins. Mo., 75, *Amphipyra*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 22, ab. pr.
1881. Riley, Ind. and Supplt. to Mo. Repts., 57, pr. var.

HABITAT.—United States east of the Rocky Mountains; Colorado; British Columbia, July to October.

Typical specimens are in the British Museum. I have not seen the type of Mr. Grote's variety; that described by Prof. Riley is in the National Museum.

Genus **ANORTHODES** Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 114.

A. prima Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 115, *Anorthodes*.

HABITAT.—Florida, May; District of Columbia, May and September; Ohio.

The type is in the National Museum. I have an uneasy suspicion that this may prove to be *Caradrina tarda* Gn. The description applies fairly well, as I have recently found, but the species is certainly no *Caradrina*.

Genus **ORTHODES** Gn.

1852. Gn., Spec. Gen., Noct., I, 371.

A monographic revision of the species is in the Proc. U. S. Nat. Mus., XII, 469. The synonymy given by me there has been modified by an examination of the types in the British Museum.

O. crenulata Butler.*

1890. Butler, Ann. & Mag. Nat. Hist., 6 ser., VI, 97, *Dyschorista*.
infirma var., Gn.
1852. Gn., Sp. Gen., Noct., I, 375, *Orthodes*.
1856. Wlk., C. B. Mus., Het., X, 446, *Orthodes*.
1874. Morr., Can. Ent., VI, 252, *Orthodes*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 9, *Orthodes*.

HABITAT.—Canada in June; New England and Middle States in July and August; Missouri; Texas in March, April, and May; Colorado.

Mr. Butler was perfectly right in separating our North American species. Guenée described his type from Brazil, and as var. *A*, mentions a specimen from New York. This is like what is in all American collections, as *infirma*; but is specifically distinct from the Brazilian specimens. Mr. Butler's type is in the British Museum.

If Lederer's description of his genus *Dyschorista* is entitled to any weight at all, it is impossible that *crenulata* can be referred to it. Mr. Butler has allowed himself to be misled by a certain habital resemblance.

O. cynica Gn.*

1852. Gn., Spec. Gen., Noct., I, 375, *Orthodes*.
1856. Wlk., C. B. Mus., Het., X, 443, *Orthodes*.
1874. Morr., Can. Ent., VI, 252, *Orthodes*.
candens Gn.
1852. Gn., Spec. Gen., Noct., I, 376, *Orthodes*.

1856. Wlk., C. B. Mus., Het., x, 444. ? an sp. dist. præc.
1874. Morr., Can. Ent., vi, 252, pr. syn.
tecta Wlk.
1865. Wlk., C. B. Mus., Het., xxxiii, 714, *Orthosia.*

Habitat.—Northern and Central United States, May to July; Canada in June and July; Nova Scotia; Colorado.

The types are all in the British Museum, and refer to the same species. Curiously enough Walker, while referring both *nimia* and *candens* Gn., as probable synonyms of *cynica*, redescribed a very obvious specimen of *cynica* as *Orthosia tecta.*

O. vecors Gn.*

1852. Gn., Spec. Gen., Noct., i, 376, *Orthodes.*
enervis Gn.
1852. Gn., Spec. Gen., Noct., iii, 420, *Orthodes.*
1856. Wlk., C. B. Mus., Het., x, 444, ? = *cynica.*
1874. Morr., Can. Ent., vi, 253, *Pseudorthodes.*
1889. Smith, Proc. U. S. Nat. Mus., xii, 471, *Orthodes.*
nimia Gn.
1852. Gn., Spec. Gen., Noct., i, 376, *Orthodes.*
1856. Wlk., C. B. Mus., Het., x, 443, an var. *cynica*?.
1874. Morr., Can. Ent., vi, 252, = *cynica.*
1889. Smith, Proc. U. S. Nat. Mus., xii, 471, = *cynica.*
togata Wlk.
1865. Wlk., C. B. Mus., Het., xxxii, 672, *Apamea.*
velata Wlk.
1860. Wlk., Can. Nat. and Geol., v, 256, ? *Celæna.*
prodeuns Wlk.
1856. Wlk., C. B. Mus., Het., x, 453, ? *Cerastis*
griseocincta Harv.
1873. Harv., Bull. Buff. Soc. Nat. Sci., ii, 120, *Orthodes.*
1874. Morr., Can. Ent., vi, 253, pr. var.
1889. Smith, Proc. U. S. Nat. Mus., xii, 472, *Orthodes.*
nitens Grt.
1883. Grt., Papilio, iii, 31, *Orthodes.*
1889. Smith, Proc. U. S. Nat. Mus., xii, 472, pr. syn.

Habitat.—District of Columbia in August; northward to Nova Scotia, west to the Mississippi Valley; Wisconsin; Canada and Massachusetts in July.

The type of *nitens* is in Mr. Neumœgen's collection, that of *griseocincta* I have not seen; all the others save *velata* are in the British Museum. *Velata* is in the Coll. Ent. Soc. of Ontario. The species is a variable one, but recognizable by the characters pointed out by me. *Griseocincta* is in the National Museum from the Meske collection, and is an aberration rather than a variety. The form *nitens* is simply a somewhat smaller and smoother type of the same thing. Guenée changed his name *vecors* to *enervis* in the index, because he had already employed *vecors* for a *Perigea.* His substituted name has been used heretofore, but I do not think the species are closely enough related to make the change necessary. Both of Walker's species in the British Museum are typical specimens of *vecors*. *Velata*, the type of which was kindly sent me by Mr. Moffat, is a badly rubbed specimen, more like *nitens* in appearance.

O. virgula Grt.

1883. Grt., Papilio, III, 76, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 473, *Orthodes.*

HABITAT.—Arizona; Colorado.

The type is in Mr. Neumœgen's collection.

O. irrorata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 478, *Orthodes.*

HABITAT.—Washington; British Columbia.

Types are in the Graef, Neumœgen, and Edwards collections.

O. puerilis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 64, *Mamestra.*
1879. Grt., Can. Ent., XI, 26, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 474, *Orthodes.*

HABITAT.—California.

The type is in the British Museum. A specimen marked "type," by Mr. Morrison, is in the National Museum.

O. agrotiformis Grt.

1881. Grt., Can. Ent., XIII, 14, *Graphiphora.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 489, *Tæniocampa.*

HABITAT.—Colorado.

The types, two females, are in the British Museum, and are best referred to *Orthodes* until the male is known. The species seems a good one.

Genus HIMELLA Grt.

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 200.
1889. Smith, Proc. U. S. Nat. Mus., XII, 467.

H. contrahens Wlk.*

1860. Wlk., Can. Nat. and Geol., V, 255, ? *Celæna.*
thecata Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 59, *Mamestra.*
1880. Grt., Can. Ent., XII, 186, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 468, *Himella.*
contrahens Grt.
1878. Grt., Bull. U. S. Geol. Surv., IV, 180, *Graphiphora.*
1881. Grt., Can. Ent., XII, 186, syn. *thecata.*

HABITAT.—Nova Scotia; Canada in July; Maine; New Hampshire in July; northern New York; Nebraska; Colorado; New Mexico.

In describing *Graphiphora contrahens* n. sp., Mr. Grote refers to the fact that he had seen a specimen labeled *contrahens* by Walker; but he seems not to have known that it had been described, and this would also account for his referring the name as a synonym of Morrison's species. To the courtesy of Mr. Moffat I owe an opportunity of examining Walker's type from the collection of the Entomological Society of Ontario, and I find it the same as Mr. Grote's species, the type of which is in the British Museum, and also like Mr. Morrison's species, the type of which is in the Tepper collection.

H. intractata Morr.*

1874. Morr., Proc. Bost. Soc., N. H., XVII, 160, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 468, *Himella.*
fidelis Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 201, *Himella.*
1879. Grt., Can. Ent., XI, 27, *Graphiphora.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 468, pr. syn.

HABITAT.—New York; Massachusetts; Missouri; Illinois.

Mr. Morrison's type is in the Tepper collection. Mr. Grote's is in the British Museum. The two are alike.

Genus CROCIGRAPHA Grt.

1875. Grt., Can. Ent., VII, 57.
1889. Smith, Proc. U. S. Nat. Mus., XII, 469.

C. normani Grt.*

1874. Grt., Can. Ent., VI, 115, *Perigrapha.*
1874. Morr., Can. Ent., VI, 251, *Tæniocampa.*
1875. Grt., Can. Ent., VII, 57, *Crocigrapha.*
1875. Grt., Can. Ent., VII, 227, pl. i, f. 13, *Crocigrapha.*

HABITAT.—Canada, in May and June; Northern and Eastern States; New York, in May and June.

I have not seen the type of this species. The British Museum specimen from the Grote collection is like the specimens in the National Museum.

Genus TÆNIOCAMPA Gn.

1839. Gn., Essai, Ann. Soc. Ent. Fr., VIII, 477.

A monographic revision of the species of this genus can be found in the Proc. U. S. Nat Mus., XII, 474.

T. furfurata Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., XXVI, 201, *Himella.*
1879. Grt., Can. Ent., XI, 27, *Graphiphora.*
1882. Grt., New List, 31, *Tæniocampa.*

HABITAT.—New York; Illinois; Arizona; Colorado; California, in October; British Columbia.

The type is in the British Museum.

T. peredia Grt.*

1883. Grt., Papilio, III, 32, *Tæniocampa.*

HABITAT.—Maine, in August; northern New York; Vermont.

The types are in the collection of Dr. Thaxter and Mr. Neumœgen.

T. perbrunnea Grt.*

1879. Grt., Can. Ent., XI, 28, *Graphiphora.*
1882. Grt., New List, 31, *Tæniocampa.*

HABITAT.—California.

The type is in the British Museum.

T. uniformis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 472, *Tæniocampa.*

HABITAT.—Arizona.

Types are in the National Museum and in the Graef collection.

T. palilis Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 273, *Dianthœcia.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 456, *Tæniocampa.*

HABITAT.—Texas in November.

The type is in the British Museum.

T. trifascia Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 118, *Tæniocampa.*

HABITAT.—Colorado.

The type is in the National Museum.

T. carminata Smith.*

1890. Smith, Ent. Amer., VI, 121, *Tæniocampa.*

HABITAT.—Colorado.

The type is in the National Museum.

T. columbia Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 472, *Tæniocampa.*

HABITAT.—Northwest British Columbia.

The types are in the National Museum and Neumœgen collection.

T. culea Gn.*

1852. Gn., Spec. Gen., Noct., I, 404, *Mesogona.*
1856. Wlk., C. B. Mus., Het., X, 174, *Mesogona.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 24, *Mythimna.*
modifica Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 150, *Tæniocampa.*
consopita Grt.
1881. Grt., Papilio, I, 154, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 180, = *modifica.*

HABITAT.—Massachusetts; New York; New Jersey; District of Columbia, in May; Florida; Illinois; Arizona.

Guenée's type is in the British Museum; Mr. Morrison's is in the Tepper collection, and Mr. Grote's is with Mr. Neumœgen. I have seen them all, and they refer to the same species. Mr. Grote's species is an inconstant color variety, while *modifica* is exactly like *culea.*

T. rufula Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Hist., II, 64, *Dianthœcia.*
1879. Grt., Can. Ent., XI, 26, *Tæniocampa.*
1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*

HABITAT.—California, July to October; Colorado.

The type is in the British Museum.

T. perforata Grt.

1883. Grt., Papilio, III, 73, *Tæniocampa.*

HABITAT.—Arizona.

The types are in Mr. Neumœgen's collection.

T. oviduca Gn.*

1852. Gn., Spec. Gen., Noct., I, 357, *Tæniocampa.*
1856. Wlk., C. B. Mus., Het., X, 429, *Tæniocampa.*
capsella Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., XXVI, 201, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 481, pr. syn.
orobia Harv.
1876. Harv., Can. Ent., VIII, 154, *Mamestra.*
1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 489, *Tæniocampa.*
1891. Smith. Trans. Am. Ent. Soc., XVIII, 116, pr. syn.

HABITAT.—Canada; Atlantic States to Florida, west to the Rocky Mountains; Northern and Eastern States, May to July.

I have compared the types of these species in the British Museum and have no doubt of their identity. In the National Museum is a duplicate of Harvey's type, from the Meske collection.

T. utahensis Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 473, *Tæniocampa.*

HABITAT.—Utah.

The type is in the National Museum.

T. curtica Smith.*

1890. Smith, Ent. Amer., VI, 122, *Tæniocampa.*

HABITAT.—Sierra Nevada, California.

Types are in the National Museum and in the Edwards collection.

T. incincta Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 133, 156, *Mamestra.*
1874. Grt., Buff. Soc. Nat. Sci., II, 215, *Mamestra.*
1881. Grt., Can. Ent., XIII, 126, *Tæniocampa.*

HABITAT.—Massachusetts; Illinois; Colorado.

The type is in the National Museum.

T. suffu[illegible] Smith.

1887. Smith, Proc. U. S. Nat. Mus., X, [illegible], *Tæniocampa.*

HABITAT.—Colorado; Arizona.

The type is in the Graef collection.

T. obtusa Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 474, *Tæniocampa.*

HABITAT.—Arizona.

The type is in Mr. Graef's collection.

T. pectinata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., x, 475, *Tæniocampa.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 118, *Tæniocampa.*

HABITAT.—California.

The original type, a somewhat broken specimen, is in the Edwards collection. A fine series of good typical specimens is in the National Museum.

T. annulimacula Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 117, *Tæniocampa.*

HABITAT.—Texas in February.

The types are in the National Museum.

T. addenda Smith.

1890. Smith, Ent. Amer., VI, 122, *Tæniocampa.*

HABITAT.—California.

The type is with Mr. Neumœgen.

T. terminata Smith.

1887. Smith, Proc. U. S. Nat. Mus., x, 475, *Tæniocampa.*

HABITAT.—Southern California.

The type is in the Tepper collection.

T. subfuscula Grt.

1873. Grt., Proc. Bost. Soc. N. H., XVI, 244, *Anarta.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. I, f. 7, *Anarta.*
1887. Smith, Proc. U. S. Nat. Mus., x, 474, *Tæniocampa.*

HABITAT.—Oregon; Montana.

The type is in the British Museum.

T. arthrolita Harv.

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 275, *Graphiphora.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 486, *Tæniocampa.*

HABITAT.—California in November.

The type is in the British Museum. It is a large broad-winged form with pointed apices of primaries, and has hardly the habitus of a *Tæniocampa*, somewhat resembling Mr. Morrison's *vegeta.* The eyes are hairy, the antennæ strongly ciliate.

T. vindemialis Gn.

1852. Gn., Spec. Gen., Noct., i, 344, *Ceramica.*
1857. Wlk., C. B. Mus., Het., x, 417, *Ceramica.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., xxvii, 418, *Mamestra.*

HABITAT.—East Florida.

The type is in the British Museum and is not at all the species so named in the American collections by Mr. Grote. It has hairy eyes and has a resemblance to *Homoglæa carnosa* in color and in a certain false appearance of transparency in the wings. I had not previously seen the species and rather suspect a West Indian origin for the specimen. It is a female and its reference here may not be final.

T. pacifica Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., ii, 120, *Graphiphora.*
1875. Grt., Can. Ent., vii, 45, =*incerta.*
1887. Smith, Proc. U. S. Nat. Mus., x, 476, an sp. dist.

HABITAT.—Colorado; California, January, February, and March.

The type is in the British Museum and is distinct from *alia* as described by me.

T. alia Gn.*

1852. Gn., Spec. Gen., Noct., i, 352, *Tæniocampa.*
1856. Wlk., C. B. Mus., Het., x, 429, *Tæniocampa.*
1875. Speyer, Stett. Ent. Zeit., xxxvi, 118, *Tæniocampa.*
1887. Smith, Proc. U. S. Nat. Mus., x, 476, *Tæniocampa.*
1891. Dyar, Can. Ent., xxiii, 156, larva.
    incerta ‡ Grt., in lists.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 116, *Tæniocampa.*
1885. Dimmock, Psyche, iv, 273, *Tæniocampa.*
1887. Smith, Proc. U. S. Nat. Mus., x, 476, pr. syn.
    instabilis Fitch.
1856. Fitch, 3d Report, Trans. N. Y. State Agl. Soc., xvi, 343, *Orthodes.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 23, =*incerta.*
1889. Smith, Proc. U. S. Nat. Mus., xii, 487, =*alia.*
    insciens Wlk.
1857. Wlk., C. B. Mus., Het., xi, 746, *Orthosia.*
    var. **hibisci** Gn.
1852. Gn., Spec. Gen., Noct., i, 355, *Tæniocampa.*
    confluens Morr.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 159, *Tæniocampa.*
1880. Grt., Can. Ent., xii, 187, =*incerta.*
1889. Smith, Proc. U. S. Nat. Mus., xii, 487, =*alia.*
1891. Smith, List Lepidoptera, 48, =*hibisci.*

HABITAT.—Canada to Georgia, west to the Mississippi States, April to June.

The types of *alia* and *insciens* are in the British Museum and are identical. Fitch's type I saw before the collection was dispersed; but I do not know who has it at present. *Hibisci* is based on a drawing which I have not seen, but the description of which accords perfectly with ***confluens***, the type of which is in the Tepper collection.

T. rubrescens Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 671, *Apamea*.
1891. Smith, Can. Ent., XXIII, 121, *Tæniocampa*.
renata Smith.
1890. Smith, Ent. Amer., VI, 123, *Tæniocampa*.
1891. Smith, Can. Ent., XXIII, 121, pr. syn.

HABITAT.—Canada; New Hampshire; northern New York.

The types of both species are now in the National Museum. *Rubrescens* was described from Dr. Bethune's collection, and to his courtesy the Museum owes the type.

T. subterminata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 476, *Tæniocampa*.

HABITAT.—Maine; New Hampshire; New York, April and May.

Types are in the National Museum and in the Tepper and Fernald collections.

T. garmani Grt.

1879. Grt., Can. Ent., XI, 28, *Tæniocampa*.

HABITAT.—Illinois; Iowa.

The type is in the British Museum.

T. præses Grt.

1879. Grt., Bull. Geol. Surv., V, 202, *Perigrapha*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 488, *Tæniocampa*.

HABITAT.—California.

The type is in the British Museum.

T. styracis Gn.

1852. Gn., Spec. Gen., Noct., I, 357, *Tæniocampa*.
1856. Wlk., C. B. Mus., Het., X, 430, *Tæniocampa*.

HABITAT.—Georgia.

The species is based on one of Abbot's figures, which I have not seen, and I have not, thus far, been able to apply the description.

T. revicta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 241. *Tæniocampa*.

HABITAT.—Illinois.

I have not been able to identify this species and do not know where the type can be found at present.

T. planalis Grt.

1883. Grt., Ann. & Mag. Nat. Hist., 1883, 53, *Agrotis*.
1883. Grt., Trans. Kans. Ac. Sci., VIII, 54, *Agrotis*—reprint.
1890. Smith, Bull. U. S. Nat. Mus., 38, 213, *Tæniocampid*.

HABITAT.—New Mexico.

The type is with Prof. Snow. I have seen it and find it a somewhat aberrant form resembling some agrotids and described as such; but with hairy eyes and unarmed legs. The present generic reference can not be considered final until confirmed by an examination of new material.

T. vegeta Morr.

1875. Morr., Proc. Ac. Nat. Sci., XXVII, 432, *Tæniocampa.*

HABITAT.—Texas.

The type is in the Tepper collection. A correctly named specimen is also in the British Museum, from the Grote collection. The species is not a *Tæniocampa* and probably belongs to the fasciatæ; but in default of sufficient study to place it certainly, I leave it here for the present. Mr. Slingerland has called my attention to the fact that the *Cissusa spadix* of Cramer, heretofore referred as a synonym of *Drasteria erechtea*, is a distinct species. On examination I find this to be the fact, and it is more than likely that it will prove the same as the above species. Material for study is lacking, therefore the reference can not be positively made.

Genus **STRETCHIA** Hy. Edw.

1874. Hy. Edw., Proc. Cal. Ac. Sci., v, 267.

The species of this genus are treated and monographically described under *Perigrapha* in the Proc. U. S. Nat. Mus., XII, 490. The European species of *Perigrapha* have a very strong resemblance habitally to the species of *Stretchia*, which has induced the reference of our species to the European genus despite recognized differences in structure. The occurrence of a structurally typical *Perigrapha* in our own fauna renders a return to another generic term necessary, and *Stretchia* somewhat antedates *Acerra* (Grt., Bull. Buff. Soc. Nat. Sci., II, 162). This law of priority plays odd tricks occasionally and here necessitates the use of a term originally referred to the Bombycidæ and irrecognizably described as against another correctly placed and well described.

S. normalis Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 162, *Acerra.*
1875. Grt., Check List Noctuidæ, pl. f. 4, *Acerra.*
1879. Grt., Can. Ent., XI, 27, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 133, *Perigrapha.*

HABITAT.—California.

The type is in the British Museum.

S. inferior Smith.'

1887. Smith, Proc. U. S. Nat. Mus., x, 477, *Perigrapha.*

HABITAT—California.

The types are in the National Museum and in the Edwards collection.

T. rubrescens Wlk.*

1865. Wlk., C. B. Mus., Het., XXXII, 671, *Apamea.*
1891. Smith, Can. Ent., XXIII, 121, *Tæniocampa.*
venata Smith.
1890. Smith, Ent. Amer., VI, 123, *Tæniocampa.*
1891. Smith, Can. Ent., XXIII, 121, pr. syn.

HABITAT.—Canada; New Hampshire; northern New Y

The types of both species are now in the National Muse *cens* was described from Dr. Bethune's collection, and to the Museum owes the type.

T. subterminata Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 476, *Tæniocampa.*

HABITAT.—Maine; New Hampshire; New York, April

Types are in the National Museum and in the Tepper collections.

T. garmani Grt.

1879. Grt., Can. Ent., XI, 28, *Tæniocampa.*

HABITAT.—Illinois; Iowa.

The type is in the British Museum.

T. præses Grt.

1879. Grt., Bull. Geol. Surv., V, 202, *Perigrapha.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 488, *Tæniocampa.*

HABITAT.—California.

The type is in the British Museum.

T. styracis Gn.

1852. Gn., Spec. Gen., Noct., I, 357, *Tæniocampa.*
1856. Wlk., C. B. Mus., Het., X, 430, *Tæniocampa.*

HABITAT.—Georgia.

The species is based on one of Abbot's figures, which seen, and I have not, thus far, been able to apply the descri

T. revicta Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 241, *Tæniocampa.*

HABITAT.—Illinois.

I have not been able to identify this species and do not k

S. plusiiformis Hy. Edw.*

1874. Hy. Edw., Proc. Cal. Ac. Sci., v, 267, *Stretchia.*
1882. Grt., New List, 31, *Perigrapha.*
1883. Grt., Proc. Am. Phil. Soc., xxi, 171, *Perigrapha.*

HABITAT.—Nevada; Colorado.

The type is in the Edwards collection.

S. muricina Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 85, *Acerra.*
1879. Grt., Can. Ent., XI, 27, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 133, *Perigrapha.*

HABITAT.—Oregon.

The type is in the Edwards collection.

S. behrensiana Grt.

1875. Grt., Can. Ent., VII, 71, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 133, *Perigrapha.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 493, *Perigrapha.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 120, *Stretchia.*

HABITAT.—California.

The type is in the British Museum. The specimens I have identified as this species are correct, but represent a distinct varietal form, too inconstant to deserve a name.

S. variabilis Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 119, *Stretchia.*

HABITAT.—Colorado, July.

The types are in the National Museum and in the Neumœgen collections.

S. pulchella Harv.

1876. Harv., Can. Ent., VIII, 54, *Graphiphora.*
1889. Smith, Proc. U. S. Nat. Mus., XII, 494, *Perigrapha.*

HABITAT.—California.

The type is in the Edward's collection.

S. erythrolita Grt.*

1879. Grt., Can. Ent., XI, 208, *Graphiphora.*
1881. Grt., Can. Ent., XIII, 133, *Perigrapha.*

HABITAT.—California.

A type is in the National Museum; another in the British Museum.

S. transparens Grt.*

1881. Grt., Bull. Geol. Surv., VI, 583, *Perigrapha.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 171, *Perigrapha.*

HABITAT.—Washington.

The type is in the National Museum from my collection.

Genus **PERIGRAPHA** Lederer.

1857. Lederer, Noct. Eur., 136.

P. prima Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 119, *Perigrapha*.

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

Genus **PERIGONICA** Smith.

1890. Smith, Ent. Amer., VI, 123.

P. angulata Smith.*

1890. Smith, Ent. Amer., VI, 124, *Perigonica*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 118, *Perigonica*.

HABITAT.—Sierra Nevada, California, in June and December.

Types are in the Edwards collection and in the National Museum.

P. fulminans Smith.*

1890. Smith, Ent. Amer., VI, 124, *Perigonica*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 118, *Perigonica*.

HABITAT.—Colorado.

Types are in the National Museum and in the Rutgers College collection.

Genus **TRICHOCLEA** Grt.

1883. Grt., Papilio, III, 30.
1889. Smith, Proc. U. S. Nat. Mus., XII, 459.

T. edwardsii Smith.*

1887. Smith, Proc. U. S. Nat. Mus., X, 478, *Trichoclea*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 460, *Trichoclea*.

HABITAT.—California.

The type is in the Edwards collection; exact duplicates are in the National Museum.

T. decepta Grt.*

1883. Grt., Papilio, III, 30, *Trichoclea*.
1889. Smith, Proc. U. S. Nat. Mus., XII, 460, *Trichoclea*.

HABITAT.—Arizona.

The types are in the National Museum and in Mr. Neumœgen's collection.

T. antica Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 116, *Trichoclea*.

HABITAT.—Los Angeles County, California, April 10.

The types are in the National Museum.

T. postica Smith.*

1891 Smith, Trans. Am. Ent. Soc., XVIII, 115, *Trichoclea*.

HABITAT.—Colorado.

The types are in the National Museum and with Mr. Neumœgen.

Genus **TRICHOCOSMIA** Grt.

1883. Grt., Can. Ent., XV, 6.

T. inornata Grt.*

1883. Grt., Can. Ent., XV, 6, *Trichocosmia.*

HABITAT.—Arizona.

Types are in the Neumœgen collection and in the National Museum.

Genus **TRICHORTHOSIA** Grt.

1883. Grt., Papilio, III, 31.

T. parallela Grt.

1883. Grt., Papilio, III, 31, *Trichorthosia.*
1883. Grt., Trans. Kans. Ac. Sci., VIII, 50, *Trichorthosia.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Trichorthosia.*

HABITAT.—New Mexico.

Types are in the Neumœgen collection.

Genus **METALEPSIS** Grt.

1875. Grt., Check List Noct., 25.

M. cornuta Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 68, *Pachnobia.*
1875. Grt., Can. Ent., VII, 155, *Pachnobia.*
1875. Grt., Check List Noct., 25, *Metalepsis.*
1876. Grt., Stett. Ent. Zeit., XXXVII, 136, *Metalepsis.*
1883. Grt., Can. Ent., XV, 129, *Metalepsis.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Metalepsis.*

HABITAT.—California.

The type specimen in the British Museum represents a form I had not seen. It looks like a small brown *Pachnobia* with fused ordinary spots. The antennæ are pectinated, front apparently smooth, eyes with hairy lashes, tibiæ unarmed.

More recently I have had this species for determination from two sources and from Western localities other than California.

Genus **PSEUDOGLÆA** Grt.

1876. Grt., Can. Ent., VIII, 18.

P. blanda Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 86, *Choephora.*
1876. Grt., Can. Ent., VIII, 18, *Pseudoglæa.*
tædata Grt.
1876. Grt., Can. Ent., VIII, 18, *Pseudoglæa.*
decepta Grt.
1881. Grt., Bull. Geol. Surv., VI, 271, *Pseudoglæa.*

HABITAT.—Colorado; Texas in October and November; California in September; Washington; Vancouver.

The types of all the above are in the British Museum, and are one species only. It is not rare, and varies more than the differences between the three species.

Genus **PSEUDORTHOSIA** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 161.

P. variabilis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 161, *Pseudorthosia*.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 207, *Pseudorthosia*.
1875. Grt., Can. Ent., VII, 45, *Pseudorthosia*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 86, *Choephora*.
1876. Grt., Can. Ent., VIII, 18, *Pseudorthosia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Pseudorthosia*.

HABITAT.—California, September and October; Colorado.

I have not seen the type, nor do I know where it is. The species is quite common in some parts of California and is well known. *P. pectinata*, the type of which is in the British Museum, is a *Pachnobia*, which I had redescribed as *ferruginoides*. A specimen labeled "type" by Mr. Morrison is in the National Museum.

Genus **CHOEPHORA** G. & R.

1868. G. & R., Trans. Am. Ent. Soc., II, 199.

C. fungorum G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., II, 200, pl. III, 74, *Choephora*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 86, *Pseudorthosia*.
1876. Grt., Can. Ent., VIII, 17, *Choephora*.
1876. Grt., Stett. Ent. Zeit., XXXVII, 136, *Pseudorthosia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Choephora*.

HABITAT.—Eastern, Middle, and Central States.

The type is in the collection of the American Entomological Society.

Genus **MESOGONA** Bdv.

1840. Bdv., Gen. et Ind. Meth., 144.

M. oxalina Hbn.

1823. Hbn., Samml. Eur. Schmett., IV, 219, *Noctua*.
1852. Gn., Spec. Gen., Noct., I, 405, *Mesogona*.
intexta Harv.
1875. Harv., Can. Ent., VII, 136, *Ipimorpha*.
1882. Grt., New List, 32, ? pr. syn.

HABITAT.—Sharon Springs, New York.

The type is in the British Museum. Mr. Grote suggests that it is a European example, and he may be correct; at all events it is exactly like ordinary specimens of *oxalina*. But, on the other hand, Mr. von Meske, who sent Dr. Harvey the specimen, was a very careful collector, and labeled the insect Sharon Springs, a favorite collecting ground.

The *Mesogona culea* of M. Guenée is a *Tæniocampa*, and will be found under that genus.

Genus **ZOTHECA** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 68.

Z. tranquila Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 69, *Zotheca*.
1891. Dyar, Can. Ent., XXIII, 205, life history.
sambuci Behr.
1874. Behr, in Strk. Lep. Rhop. et Het., 94, *Cosmia*.
1885. Behr, Bull. Cal. Ac. Sci., III, 61, *Euperia*.
var. **viridula** Grt.
1878. Grt., Bull. Geol. Surv., IV, 180, pr. var.

HABITAT.—California.

Mr. Grote's types are in the British Museum, where there are also two specimens, one of each form, marked " *Cosmia sambuci* Behr, don. O. S. 8, '78." The O. S., refers to Baron von Osten Sacken, who probably obtained either specimens or name from Dr. Behr himself. Mr. Strecker has also named this *sambuci* for collectors.

Genus **CALYMNIA** Hbn.

1816. Hbn., Verzeichniss, 235.

C. orina Gn.*

1852. Gn., Spec. Gen., Noct., II, 10, *Cosmia*.
1856. Wlk., C. B. Mus., Het., X, 489, *Cosmia*.
1873. Grt., Can. Ent., V, 205, *Cosmia*.
1873. Saund., Can. Ent., V, 206, *Cosmia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 24, *Calymnia*.
var. **calami** Harv.
1876. Harv., Can. Ent., VIII, 54, *Calymnia*.

HABITAT.—Canada, in July, to Texas; Colorado; California; Massachusetts, July and August; Texas, May and June.

Specimens apparently determined by Guenée are in the British Museum, where also Dr. Harvey's type is. The latter is the paler form, and bears much the same relation to *orina* that *Zotheca viridifera* does to *tranquila*.

Genus **IPIMORPHA** Hbn.

1816. Hbn., Verzeichniss, 238.

I. pleonectusa Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 191, *Ipimorpha*.
æquilinea Smith.
1882. Smith, Bull. Bkln. Ent. Soc., V, 67, *Calymnia*.
1891. Smith, List Lepidoptera, 49, pr. syn.

HABITAT.—Colorado; Utah; New York in July and August; Massachusetts in August; New Jersey.

The type is in Dr. Lintner's collection.

I. subvexa Grt.

1876. Grt., Can. Ent., VIII, 189, *Ipimorpha*.
1882. Grt., New List, 32, ? pr. var.

HABITAT.—Texas; Colorado.

I have not seen the type and do not know where it is. Mr. Grote has suggested that it may be the southern form of the preceding, but later lists it as a good species. I am not in a position to decide the matter and leave it as Mr. Grote did.

Genus **TRILEUCA** Grt.

1883. Grt., Proc. Am. Phil. Soc., xxi, 166.

T. buxea Grt.

1882. Grt., Can. Ent., xiii, 230, *Schinia*.
1882. Grt., Papilio, ii, 64, pl. i, f. 4, *Schinia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 166, *Trileuca*.

HABITAT.—Southwestern Texas.

The type is in Mr. Neumœgen's collection.

T. dentalis Smith.

1891. Smith, Trans. Am. Ent. Soc., xviii, 123, *Trileuca*.

HABITAT.—Southern Texas.

The type is in Mr. Neumœgen's collection.

T. gulnare Strk.

1878. Strk., Proc. Dav. Ac. Sci., ii, 274, pl. ix, f. 1, *Schinia*.
1883. Smith, Trans. Am. Ent. Soc., x, 252, *Schinia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 153, *Trileuca*.

HABITAT.—Pennsylvania; Illinois.

The type is with Mr. Strecker. I have seen one other specimen. It may not be congeneric with the others referred here, but it is nearer right than with *Schinia*. Strictly, *rectifascia* is the type of *Trileuca*, because *buxea* was placed in *Xanthodes* on p. 153, and is only incidentally referred to *Trileuca* on p. 166; but *rectifascia* is an *Atethmia*, and the genus, as based on that species, of course, a synonym. Mr. Grote did not see proof of this paper in the Proc. Am. Phil. Soc., which is full of typographical and other errors, else he would have seen the contradiction, and it is in accordance with "the usual comity and practice" that I retain the name with *buxea* as type.

Genus **ATETHMIA** Hbn.

1816. Hbn., Verzeichniss, 238.

A. subusta Hbn.*

1818. Hbn., Zutræge, ii, 205, 206, *Atethmia*.
1816. Hbn., Verzeichniss, 238, *Atethmia*.
1852. Gn., Spec. Gen., Noct., ii, 13, *Atethmia*.
1856. Wlk., C. B. Mus., Het., x, 490, *Atethmia*.

HABITAT.—Florida; Texas; Central and South America

Mr. Druce says, in the Biol. Cent. Am., Het. 290, that *Anthophila erecta* Wlk., *Poaphila congesta* Wlk., and *Laphygma trilineata* Wlk., are all the same as *subusta* Hbn., and he is probably right.

A. inusta Gn.*

1852. Gn., Spec. Gen., Noct., II, 12, *Atethmia*.
1856. Wlk., C. B. Mus., Het., X, 491, *Atethmia*.

HABITAT.—Texas; Florida.

Both the above species are South American and are scarcely distinct. I have received them for identification on several occasions and have seen them in collections both from Texas and Florida. I have no references to the South American literature, and in our own the species have not been heretofore referred to.

A. rectifascia Grt.*

1874. Grt., Proc. Bost. Soc. N. H., XVI, 242, *Schinia*.
1883. Smith, Trans. Am. Ent. Soc., X, 247, *Schinia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 166, *Trileuca*.

HABITAT.—New Jersey; Pennsylvania; Alabama; Illinois.

Specimens from the Grote collection, apparently not types, are in the British Museum. The species is larger than, but fully congeneric with, the preceding.

A. canescens Behr.

1885. Behr, Bull. Cal. Ac. Sci., III, 61, *Atethmia*.

HABITAT.—California.

It is almost certain that under this name Dr. Behr redescribes *Calymnia orina* Gn., and its variety *calami* Harv. I have not seen Californian specimens, however, and therefore cite the species as described.

Genus CEA Grt.

1883. Grt., Papilio, III, 78.

C. immaculata Grt.

1883. Grt., Papilio, III, 78, *Cea*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 171, *Cea*.

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

Genus COSMIA Ochs.

1816. Ochs., Schmett. Eur., IV, 84.

C. paleacea Esp.*

1788. Esper, Schmetterlinge, pl. 122, f. 504, *Noctua*.
1857. Lederer, Schmett. Eur., 143, *Cosmia*.
discolor Wlk.
1859. Wlk., C. B. Mus., Het., XV, 1658, *Mythimna*.
1882. Grt., Ill. Essay, 41,=*infumata*.
infumata Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 160, *Orthosia*.
1877. Grt., Can. Ent., IX, 22, *Cosmia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, ? pr. syn.

HABITAT.—United States generally; Canada and Northern and Eastern States in August and September.

The types of *infumata* and *discolor* are in the British Museum and are the same species; nor can I find them different from the European forms under the same name.

C. perophoroides Strk.

1876. Strk., Proc. Ac. Nat. Sci. Phil., XXVIII, 152, *Cosmia*.

HABITAT.—Florida.

The type is in the Strecker collection. I do not know the species.

Genus **CLEOCERIS** Bdv.

1829. Bdv., Index Meth., 93.

C. onychina Gn.

1852. Gn., Spec. Gen., Noct., II, 48, *Epunda*.
1857. Wlk., C. B. Mus., Het., XI, 528, *Raphia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 25, *Cleoceris*.

HABITAT.—North America.

The type is probably with M. Oberthür, and I have not seen it. The species has not been identified in American collections.

C. elda French.*

1887. French, Can. Ent., XIX, 5, *Homohadena*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 108, *Dryobota*.

HABITAT.—California, Sierra Nevada, September.

Prof. French has his type and has kindly sent me a compared specimen.

C. rectifascia Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 109, *Dryobota*.

HABITAT.—Sierra Nevada, California.

Types are in the National Museum and in the Edwards collection.

C. curvifascia Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 109, *Dryobota*.

HABITAT.—California, Sierra Nevada, and Placer County, in September.

Types are in the National Museum and in the Edwards collection.

The last three species are referred to *Cleoceris* after comparing material in the British Museum. I do not consider the genus at all well placed in the series; but until the necessary critical studies are made, changes are tentative at best, and no harm is done in leaving it here for the present.

Genus **ANCHOCELIS** Gn.

1839. Gn., Ann. Soc. Ent. Fr., 483.

A. digitalis Grt.*

1882. Grt., Bull. Geol. Surv., VI, 584, *Anchocelis*.

HABITAT.—Maine; New Hampshire; New York; Illinois.

The type is with Mr. Neumœgen.

Genus **PYRRHIA** Hbn.

1816. Hübner, Verzeichniss, 262.

P. umbra Hufn.*

1767. Hufnagel, Berliner Mag., III, 294, *Noctua*.
1852. Gn., Spec. Gen., Noct., II, 178, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 223, *Chariclea*.
exprimens ‡ Grt.
1868. G. & R., Trans. Am. Ent. Soc., III, 180, ? pr. syn.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 124, *Chariclea*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 35, pl. III, f. 5, *Pyrrhia*.
1874. Lint., Ent. Cont., III, 163, larva, *Chariclea*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 156, 350, *Pyrrhia*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 10, pr. syn.
1881. Grt., Bull. Geol. Surv., VI, 561, *Pyrrhia*.
1883. Smith, Trans. Am. Ent. Soc., x, 223, pr. syn.
1891. Butler, Entomologist, XXIV, 292, pr. syn.
var. **exprimens** Wlk.*
1857. Wlk., C. B. Mus., Het., XI, 687, *Heliothis*.
1891. Butler, Entomologist, XXIV, 292, *Pyrrhia*.
angulata Grt.
1874. Grt., Trans. Am. Ent. Soc., V, 93, *Pyrrhia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. III, f. 6, *Pyrrhia*.
1876. Speyer, Stett. Ent. Zeit., XXXVII, 203, an sp. dist.
1881. Coquillett, Papilio, I, 8, larva.
1882. Grt., Bull. Geol. Surv., VI, 564, *Pyrrhia*.
1883. Smith, Trans. Am. Ent. Soc., x, 223, *Chariclea*, et pr. syn.
1883. Hy. Edw., Papilio, III, 135, larva.
1886. Grt., Can. Ent., XVIII, 231, an sp. dist.
1891. Butler, Entomologist, XXIV, 292, =*exprimens*.

HABITAT.—Canada in June and July; Eastern and Central United States, June to August; Colorado.

Walker's type is in the British Museum, and so is the type of *angulata* Grt. Mr. Butler has already shown that Mr. Grote did not correctly identify Walker's species, and redescribed it as *angulata*. In the Museum at Berlin are specimens from Brazil marked *cilisca* Gn., (Noct. II, 179), which I think will fall in with this species. The place assigned the genus here expresses my conviction that the genus is Orthosiid rather than Heliothid, though it may find closer allies on future study.

P. stilla Grt.

1880. Grt., No. Am. Ent., I, 45, *Pyrrhia*.
1881. Grt., Trans. Kans. Ac. Sci., VII, 68, *Pyrrhia*.
1882. Grt., Bull. Geol. Surv., VI, 564, *Pyrrhia*.

HABITAT.—Colorado; New Mexico; Western States.

The type is with Prof. Snow.

Genus **PARASTICHTIS** Hbn.

1816. Hbn., Verzeichniss, 212.

P. discivaria Wlk.*

1856. Wlk., C. B. Mus., Het., ix, 27, *Bryophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 8, *Jaspidea*
1882. Grt., Ill. Essay, 40, *Parastichtis.*
gentilis Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 143, *Tæniosea.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 432, *Dyschorista.*
1875. Grt., Can. Ent., vii, 226, pl. i, f. 1, *Parastichtis.*
1882. Grt., Ill. Essay, 40, pr. syn.
var. **perbellis** Grt.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 144, *Tæniosea.*
1875. Grt., Can. Ent., vii, 226, pl. i, f. 2, *Parastichtis.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 432, *Dyschorista.*

HABITAT.—Hudson's Bay Territory; Canada in June and July; Northern, Eastern, Middle, and Central States, June and July and August.

Types of all the names are in the British Museum, and refer to the same species. *Dyschorista* Led., is the genus to which this species should be referred if Hübner's name does not apply. Mr. Grote has himself referred *perbellis* as a variety.

Genus **ORTHOSIA** Ochs.

1816. Ochs., Schmett. Eur., iv, 79.

O. purpurea Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 125, *Orthosia.*
var. **crispa** Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., ii, 276, *Orthosia.*
1881. Butler, Papilio, i, 169, *Orthosia.*

HABITAT.—California, October and November.

The types are in the British Museum. *Crispa* is a paler form, but differs in nothing else. There is a very large series of specimens in the National Museum that makes the relationship between these two forms clear.

O. decipiens Grt.

1881. Grt., Bull. Geol. Surv., vi, 269, *Orthosia.*

HABITAT.—Northern Indiana in June.

The type is in the British Museum.

O. ralla G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., i, 346, pl. vii, f. 49, *Xanthia*
1874. Morr., Proc. Ac. Nat. Sci. Phil., 1874, 66,=*ferruginoides.*
1875. Morr., Can. Ent., vii, 78,=*Orth. ferruginoides.*
1875. Lintner, Can. Ent., vii, 78, an bona species.

HABITAT.—Eastern and Middle States.

Specimens from the Grote collection are in the British Museum; but there is none marked type. I have no knowledge where the original specimens are at present.

O. bicolorago Gn.*

1852. Gn., Spec. Gen., Noct., I, 397, *Xanthia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci. II, 124, var. *ferruginoides.*
1875. Morr., Proc. Ac. Nat. Sci., 1875, 66,=*ferruginoides.*
spurcata Wlk.
1857. Wlk., C. B. Mus., Het., XI, 749, *Xanthia.*
1868. G. & R., Trans. Am. Ent. Soc., III, 78, pr. syn.
var **ferruginoides** Gn.
1852. Gn., Spec. Gen., Noct., I, 398, *Xanthia ferruginea,* var.
1868. Bethune, Can. Ent., I, 47 (49), *Xanthia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 124, *Orthosia.*
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 66, *Xanthia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 119, *Orthosia.*
bicolorago ‡ Wlk.
1856. Wlk., C. B. Mus., Het., X, 464, *Xanthia.*
1868. G. & R., Trans. Am. Ent. Soc., III, 78, pr. syn.

HABITAT.—Canada to Pennsylvania, west to the Mississippi Valley, August to November.

The types are all in the British Museum and refer to one species only. It is rather curious that *ferruginoides* should so long have stood for the species with *bicolorago* as the variety, while the opposite must be the status. *Bicolorago* precedes *ferruginoides* by one page and was described as a species; while *ferruginoides* was placed as a variety of the European *ferruginea.*

O. euroa G. & R.*

1873. G. & R., Trans. Am. Ent. Soc., IV, 431, *Xanthia.*
puta ‖ G. & R.
1868. G. & R., Trans. Am. Ent. Soc., I, 347. pl. 7, f. 50, *Xanthia.*
1873. G. & R., Trans. Am. Ent. Soc., IV, 431, n. b. l.

HABITAT.—Canada in July and September, to Pennsylvania, to the Mississippi Valley; Colorado.

I have not seen the type. Specimens named by Mr. Grote are in the British Museum.

O. inops Grt.*

1881. Grt., Bull. Geol. Surv., VI, 270, *Orthosia.*

HABITAT.—Kittery Point, Maine, in September.

The type is in the British Museum; duplicates are in Dr. Thaxter's collection.

O. hamifera Grt.

1888. Grt., Can. Ent., XX, 130, *Orthosia.*

HABITAT.—California.

I have not seen the type. It is probably in Mr. Grote's possession, or it may be with Mr. Jas. Behrens in San Francisco. It is said to be near *purpurea,* but larger.

O. aurantiago Gn.*

1852. Gn., Spec. Gen., Noct., I, 394, pl. 7, f. 1, *Xanthia.*
1856. Wlk., C. B. Mus., Het., X, 464, *Xanthia.*
1880. Grt., Can. Ent., XII, 186, *Orthosia.*
illiterata Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 211, *Pyrrhia.*
1880. Grt., Can. Ent., XII, 186, pr. syn.
differta Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 67, *Orthosia.*
1880. Grt., Can. Ent., XII, 186, pr. syn.
illinoisensis French.
1879. French, Can. Ent., XI, 77, *Heliothis.*
1879. Grt., North Am. Ent., I, 16 = *illiterata.*

HABITAT.—New York to Florida; Illinois; Missouri; Massachusetts in August; Wisconsin.

The types of *aurantiago* and *illiterata* are in the British Museum. The type of *differta* is in the Tepper collection, while Prof. French has his own typical specimen.

O. americana Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 434, *Orthosia.*

HABITAT.—New York.

The type is in the Tepper collection.

O. posticata Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 8, *Orthosia.*

HABITAT.—Texas in November.

The type is in the British Museum.

O. citima Grt.

1883. Grt., Papilio, III, 74, *Orthosia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

O. conradi Grt.*

1879. Grt., Bull. Geol. Surv., V, 203, *Orthosia.*

HABITAT.—Pennsylvania; New York; Middle and Eastern States.

The type is in the British Museum.

O. helva Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 310, *Orthosia.*
1875. Grt., Can. Ent., VII, 84, *Orthosia.*

HABITAT.—Canada to Pennsylvania, August and September; west to the Mississippi Valley; Colorado.

The type is in the British Museum. This seems to be the species referred to by Mr. Grote as *circillaris*, in the Bull. Buff. Soc. Nat. Sci., II, 124.

O. lutosa Andrews.*

1877. Andrews, Can. Ent., IX, 99, *Orthosia*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 93, *Orthosia*.

HABITAT.—Middle, Eastern, and Central States; Vermont; New York in June; New Jersey.

The type is with Mr. Akhurst, of Brooklyn.

O. immaculata Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 433, *Orthosia*.

HABITAT.—Nevada.

The species was described from the collection of the Museum of Comparative Zoölogy at Cambridge, where the type now is.

O. belangeri Morr.

1874. Morr., Proc. Bost. Soc. N. H., XVII, 149, *Orthosia*.

HABITAT.—Canada.

The type is in the Tepper collection.

O. chloropha Hbn.

1806. Hbn., Samml. Ex. Schmett., I, 16. f. 73, 74, *Xestia*.
1816. Hbn., Verzeichniss, 233, *Xestia*.
1856. Wlk., C. B. Mus., Het., X, 470, *Xestia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 25, *Xanthia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 125, *Orthosia*.
1880. Grt., Can. Ent., XII, 86, *Orthosia*.

HABITAT.—Georgia; Florida.

This species has not yet been identified in American collections.

Genus HOMOGLÆA Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 240.

H. hircina Morr.*

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 240, *Homoglæa*.
1878. Grt., Bull. Geol. Surv., IV, 181, *Homoglæa*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 39, *Homoglæa*.

HABITAT.—Northern United States, east of the Rocky Mountains; Illinois.

The type is in the Neumœgen collection. A named specimen in the British Museum from the Grote collection is like my identification of the species and like the type.

H. carnosa Grt.*

1877. Grt., Can. Ent., IX, 21 et 70, *Glæa*.
1878. Grt., Bull. Geol. Surv., IV, 181, *Homoglæa*.

HABITAT.—Maine; New York; Massachusetts.

The type is in the British Museum. The species is recorded from Long Island, but I do not remember having seen it in local collections.

Genus GLÆA Hbn.

1806. Hübner, Tentamen.

In using the term *Glœa* and crediting it to Hübner, I follow Mr. Grote. I am not sure that our species of *Glœa* are entirely congeneric with the European species referred to *Cerastis* or *Orrhodia* and therefore prefer to use a distinctive term. As a matter of course, if our species do prove generically distinct, Hübner's name can not hold; but until a critical study settles these matters it will be safer to use a familiar term. *G. anchoceloides* has been listed under *Rhynchagrotis* and will be found replacing *cupida* Grt. In Can. Ent., XII, 155, Mr. Grote has listed the species and divided them into named sections, which he afterwards used as genera.

G. viatica Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 29, *Orthosia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 125, *Glœa.*
1878. Grt., Bull. Geol. Surv., IV, 181, *Cerastis.*
1880. Grt., Can. Ent., XII, 155, *Glœa.*

HABITAT.—Massachusetts in October; New York; Alabama; Middle and Southern States; Texas in November.

The type is in the British Museum. It is perhaps the largest of our species, but has nearly the markings of *decliva*, which is referred to *Epiglœa.*

G. inulta Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 30, *Orthosia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 125, pl. 1, f. 9, *Glœa.*
1878. Grt., Bull. Geol. Surv., IV, 181, *Cerastis.*
1880. Grt., Can. Ent., XII, 155, *Glœa.*

HABITAT.—Canada to Virginia, west to Illinois; Iowa, September and October.

The type is in the British Museum. It is perhaps our most common species.

G. olivata Harv.

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 120, *Glœa.*
1878. Grt., Bull. Geol. Surv., IV, 181, *Cerastis.*
1880. Grt., Can. Ent., XII, 155, *Glœa.*

HABITAT.—California in September.

The type is in the British Museum.

G. signata French.*

1879. French, Can. Ent., XI, 76, *Orthosia.*
anchoceloides ‡ Grt.
1679. Grt., No. Am. Ent., I, 16, *Glœa.*

HABITAT.—Middle and Central States; New York; Illinois; District of Columbia in April.

Prof. French has his own type and has kindly sent me a duplicate. Guenée's description would be distinctly applicable were the generic reference correct.

G. sericea Morr.*

1874. Morr., Proc. Bost. Soc. N. H., xvii, 151, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, = *venustula.*
1880. Grt., Bull. Bkln. Ent. Soc., iii, 37, = *venustula.*
1890. Grt., Revised List Noct., 27, note 16, an sp. dist.

HABITAT.—Massachusetts in October; Illinois; Middle and Central States, September and October; Wisconsin; District of Columbia.

I have not seen the type and have no knowledge of its present whereabouts. Mr. Grote, after referring his species *venustula* as a synonym of that described by Mr. Morrison, now claims it distinct. As I have not had an opportunity of comparing types, I accept Mr. Grote's latest reference until further study decides the matter.

Genus **EPIGLÆA** Grt.

1878. Grt., Bull. Geol. Surv., iv, 181.

E. pastillicans Morr.*

1874. Morr., Proc. Bost. Soc. Nat. Hist., xvii, 151, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa.*

HABITAT.—New Hampshire in September; Massachusetts in October; New York in September; District of Columbia in October.

I have not seen the type, nor do I know where it is at present.

E. tremula Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., ii, 276, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa.*

HABITAT.—Texas in November.

The type is in the British Museum.

E. venustula Grt.

1875. Grt., Can. Ent., vii, 84, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa.*
1890. Grt., Revised List Noct., 27, note 16, *Epiglæa.*

HABITAT.—Maryland.

The type is in Dr. Lintner's collection.

E. apiata Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 30, *Orthosia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 125, pl. i, f. 8, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa.*

HABITAT.—Massachusetts in October; New York in September; Illinois; Middle and Central States.

The type is in the British Museum.

E. decliva Grt.*

1874. 6th Rept. Peab. Ac. Sci., 30, *Orthosia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 125, *Glæa.*
1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa.*

deleta Grt.

1877. Grt., Psyche, ii, 80, *Glæa*.

1878. Grt., Bull. Geol. Surv., iv, 181, *Epiglæa*.

1890. Grt., Revised List Noct., 27, pr. var.

HABITAT.—Canada in September and October; Eastern, Middle, and Central States; Massachusetts in September; District of Columbia in October.

The type of *decliva* is in the British Museum. Of *deleta* Mr. Thaxter has typical specimens, and these are not different from the usual forms of *decliva*.

Genus ORRHODIA Hbn.

1816. Hbn., Verzeichniss, 231.

O. californica Smith.*

1891. Smith, Trans. Am. Ent. Soc., xviii, 113, *Orrhodia*.

HABITAT.—Sierra Nevada, California.

The type is in the National Museum. This seems more nearly congeneric with the European species.

Genus XANTHIA Ochs.

1816. Ochs., Schmett. Eur., iv, 82.

X. flavago Fabr.*

1787. Fabr., Mant. Ins., 160, *Noctua*.

1857. Wlk., C. B. Mus., Het., xi, 715, *Gortyna*.

togata Esp.

1788. Esper, Schmett. Eur., pl. 124, f. 1, *Noctua*.

1876. Speyer, Stett. Ent. Zeit., xxxvi, 204, *Xanthia*.

silago Hbn.

1800. Hbn., Samml. Eur. Schmett., Noct., 191, *Noctua*.

1816. Hbn., Verzeichniss, 234, *Citria*.

1852. Gn., Spec. Gen., Noct., i, 394, *Xanthia*.

1856. Wlk., C. B. Mus., Het., x, 461, *Xanthia*.

HABITAT.—Canada; Northern and Eastern States; Northern New York, September.

I follow Staudinger in the synonymy. Staudinger, Walker, and Guenée should be consulted for European bibliography. The insect seems to have been very little referred to in our own literature.

X. puta G. & R.

1868. G. & R., Trans. Am. Ent. Soc., i, 347, pl. 7, f. 50, *Xanthia*.

HABITAT.—Northern and Eastern States; New York.

I have not seen the type and do not know its present whereabouts.

Genus JODIA Hbn.

1816. Hbn., Verzeichniss, 234.

J. rufago Hbn.*

1818. Hbn., Zutraege, 15, ff. 61, 62, *Jodia*.

1816. Hbn., Verzeichniss, 234, *Jodia*.

1852. Gn., Spec. Gen., Noct., i, 392, *Xanthia*.

1856. Wlk., C. B. Mus., Het., x, 464, *Xanthia*.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 25, *Xanthia.*
1880. Grt., Can. Ent., XII, 86, *Jodia.*
honesta Wlk.
1859. Wlk., C. B. Mus., Het., XIV, 1711, *Cirrœdia.*

HABITAT.—Canada to Florida, west to Texas; Massachusetts and New Jersey in April; Texas in March, February, and May.

Walker's type is in the British Museum and is the same as the *Jodia rufago* of that collection.

Genus CIRRŒDIA Gn.

1852. Gn., Spec. Gen., Noct., I, 401.

C. pampina Gn.*

1852. Gn., Spec. Gen., Noct., I, 402, pl. 7, f. 2, *Cirrœdia.*
1856. Wlk., C. B. Mus., Het., X, 472, *Cirrœdia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 24, *Atethmia.*
1874. Morr., Can. Ent., VI, 259, *Cirrœdia.*
1875. Grt., Can. Ent., VII, 206, *Eucirrœdia.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, *Eucirrœdia.*

HABITAT.—Nova Scotia, southward to Virginia, west to the Rocky Mountains, August to October.

Guenée's type is in the British Museum. I can not see the slightest basis for Mr. Grote's genus in his description of it.

Genus SCOLIOPTERYX Germ.

1812. Germ., Syst. Gloss. Prodromus, 14.

S. libatrix Linn.*

1758. Linn., Syst. Nat., ed. X, 507, *Bombyx.*
1767. Linn., Syst. Nat., ed. XII, 831, *Bombyx.*
1781. Fabr., Spec. Ins., II, 224, *Noctua.*
1793. Fabr., Ent. Syst., III, 2, 64, *Noctua.*
1816. Hbn., Verzeichniss, 248, *Euphemias.*
1825. Treitschke, Schmett. Eur., V, 2, 172, *Calpe.*
1852. Gn., Spec. Gen., Noct., II, 405, *Gonoptera.*
1858. Wlk., C. B. Mus., Het., XIII, 1010, *Scoliopteryx.*
1874. Lintner, Ent. Cont., III, 164, larva.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 167, *Scoliopteryx.*
1879. Andrews, Psyche, II, 272, *Scoliopteryx*, larva.
1881. Coquillett, Papilio, I, 56, larva.

HABITAT.—Nova Scotia; Hudson Bay Territory; south to Texas, west to California; New Mexico, May to November.

Most of the European bibliography is omitted. Reference should be made to Staudinger, Walker, and Guenée.

Genus SCOPELOSOMA Curtis.

1838. Curtis, British Insects, XIV, 635.

A revision of the species of this genus is in Entomologica Americana for 1890, volume VI, p. 146. An examination of the types of all the species in the British Museum and elsewhere shows that the identifications made and characters given are correct. Only one change in name is necessitated. All the species appear in the autumn and winter as imagos, reappearing in early spring.

S. indirecta Wlk.*

1857. Wlk., Cat. Brit. Mus., Het., x, 468, *Xanthia.*
graefiana Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 69, *Scopelosoma.*
1882. Grt., Bull. Geol. Surv., VI, 583, *Scopelosoma.*

HABITAT.—District of Columbia and northward.

The Grote and Walker types are both in the British Museum, and I regret that I can not find any differences between them. Walker's species is from "locality unknown."

S. moffatiana Grt.*

1882. Grt., Bull. Geol. Surv., VI, 583, *Scopelosoma.*
graefiana ‡ Grt.
1882. Grt., Ill. Essay, 65, pl. 3, f. 38, *Scopelosoma.*
1882. Grt., Bull. Geol. Surv., VI, 583, pr. syn.
1888. Pearsall, Ent. Amer., IV, 59, larva.

HABITAT.—District of Columbia and northward.

This species does not seem to be in the British Museum. The type is with Mr. Neumœgen.

S. pettiti Grt.*

1875. Grt., Can. Ent., VII, 188, *Scopelosoma.*
1877 Grt., Can. Ent., IX, 213, *Scopelosoma.*

HABITAT.—Canada; New York; Iowa.

The type is in the British Museum.

S. ceromatica Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 70, *Scopelosoma.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 125, *Xanthia.*

HABITAT.—New Jersey; New York; New Hampshire; Maine; Canada.

The type is the British Museum.

S. tristigmata Grt.*

1877. Grt., Can. Ent., IX, 156, *Scopelosoma.*
1884. Thaxter, Can. Ent., XVI, 33, life history.

HABITAT.—District of Columbia, northward.

The type is in the British Museum.

S. walkeri Grt.*

1864. Grt., Proc. Ent. Soc. Phil., II, 439, pl. 9, f. 5, *Dichagramma.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 192, *Scopelosoma.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 71, an var. *sidus.*
1875. Grt., List Noctuidæ, 14, an sp. dist.
1882. Grt., New List, 32, an var. *sidus.*
1884. Thaxter, Can. Ent., XVI, 31, an sp. dist.—life history.

HABITAT.—Texas; Iowa; New York; Maine; Canada.

I did not see this species in the British Museum. I do not know where the type is.

S. sidus Gn.*

1852. Gn., Spec. Gen., Noct., I, 386, *Scopelosoma.*
1856. Wlk., C. B. Mus., Het., X, 454, *Eupsilia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 191, *Scopelosoma.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 71, *Scopelosoma.*
vinulenta Grt.
1864. Grt., Proc. Ent. Soc. Phil., II, 440, pl. 9, f. 6, *Dichagramma.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 191, pr. syn.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 70, an sp. dist.
1882. Grt., New List, 32, an var. *sidus.*
1884. Thaxter, Can. Ent., XVI, 32, life history.

HABITAT.—Texas; New York, and northward.

Guenée's type is in the British Museum and is like Mr. Grote's *vinulenta.*

S. morrisoni Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 70, *Scopelosoma.*
1884. Thaxter, Can. Ent., XVI, 30, life history.

HABITAT.—New York; Massachusetts, northward to Canada.

The type is in the British Museum.

S. devia Grt.*

1874. Grt., Proc. Aç. Nat. Sci. Phil., 1874, 209, *Scopelosoma.*
1884. Thaxter, Can. Ent., XVI, 33, life history.

HABITAT.—New York and northward.

This type is in the British Museum.

Genus LITHOLOMIA Grt.

1875. Grt., Can. Ent., VII, 206.

L. napæ Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 152, *Scopelosoma.*
1875. Grt., Can. Ent., VII, 206, 207, pl. I, f. 4, *Litholomia.*

HABITAT.—Canada in May; Massachusetts; New York; Northern and Eastern States; Colorado; California in September.

I have not seen the type, nor do I know where it is at present.

L. dunbari Harv.

1876. Harv., Can. Ent., VIII, 52, *Hadena.*

HABITAT.—Vancouver.

The type is in the Edwards collection and is fully congeneric with and closely allied to *napæ* Morr. It is scarcely likely that the two will prove to be identical, but the differences are reducible to small variations in markings and are in no sense generic. I have handled a very large number of specimens of *napæ*, without finding a *dunbari* among them.

Genus XYLINA Ochs.

1816. Ochs., Schmett. Eur., IV, 85.

I use this name in preference to *Lithophane* because both are catalogue names and *Xylina* has priority. The Verzeichniss was not published until 1818 at least. All the species so far as known to me appear in autumn, hibernate, and reappear in early spring.

X. disposita Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 116, *Lithophane.*

HABITAT.—Canada; Massachusetts; New York in April and May. I have not seen the type and do not know where it is.

X. hemina Grt.

1879. Grt., Bull. Geol. Surv., V, 202, *Lithophane.*

HABITAT.—Northern and Eastern States; New York in September. The type is in the British Museum.

X. signosa Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 627, *Xylina.*
petulca Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., 31, *Lithophane.*
1891. Butler, Entomologist, XXIV, 242, pr. syn.

HABITAT.—Canada; Northeastern United States.

The types are both in the British Museum and refer to the same species. Mr. Grote has misidentified Walker's species, the ***signosa*** Grote remaining unnamed.

X. gausapata Grt.

1883. Grt., Papilio, III, 77, *Lithophane.*

HABITAT.—California.

The type should be in Mr. Neumœgen's collection.

X. ferrealis Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 32, *Lithophane.*

HABITAT.—New York; Maine; Canada.

The type is in the British Museum. A long series of specimens in Dr. Thaxter's collection some years ago led me to believe in a rather close relation between *ferrealis* and ***signosa*** (*petulca*). I have not studied them since.

X. innominata nom nov.*

signosa ‡ Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., 33, *Lithophane.*

HABITAT.—Northeastern United States; Canada; Colorado.

The new name is intended to apply to that species identified and labeled as ***signosa*** by Mr. Grote and has no type specimen.

X. bethunei G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 354, pl. 7, f. 56, *Xylina.*
1869. Bethune, Can. Ent., I, 86, *Xylina.*
1874. Grt., 6th Rept. Peab. Ac. Sci., 33, *Lithophane.*

HABITAT.—Canada; Northern, Eastern, and Middle States.

I do not know where the type of this species is at present.

X. oriunda Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 160, *Lithophane.*

HABITAT.—Canada; Wisconsin.

I have not seen the type and do not know where it is.

X. semiusta Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane.*

HABITAT.—Canada; New York; Vermont; Maine.

A type is in the British Museum; another in the Tepper collection.

X. contenta Grt.

1880. Grt., Can. Ent., XII, 216, *Lithophane.*

HABITAT.—California.

The type is in the British Museum.

X. fagina Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 115, *Lithophane.*
1887. Grt., Can. Ent., XIX, 54, *Lithophane.*

HABITAT.—Massachusetts; New York.

The type is in the Tepper collection.

X. oregonensis Harv.

1876. Harv., Can. Ent., VIII, 55, *Lithophane.*

HABITAT.—Oregon; California; Colorado.

The type is in the Hy. Edwards collection.

X. georgii Grt.*

1875. Grt [illegible] Ent., VII, 188, *Lithophane.*
1887. Grt., Can. Ent., XIX, 55, *Lithophane.*

HABITAT.—Canada; Maine; New York; Northern and Eastern States; Colorado.

The type is in the British Museum.

X. antennata Wlk.*

1858. Wlk., C. B. Mus., Het., XIV, 1733, *Xylina.*
1883. Saund., Fruit Insects, 138, f. 138, *Lithophane.*
cinerea Riley.
1871. Riley, 3d Rept. Ins. Mo., 135, f. 57, *Xylina.*
1874. Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane.*
1879. Grt., Bull. Geol. Surv., V, 201, pr. syn.
1881. Riley, Index and Supplt. to Mo. Repts., 74, *Lithophane.*
1882. Riley, Papilio, II, 43, 101, an sp. dist.?
1882. Fernald, Papilio, II, 63, pr. syn.
1891. Butler, Entomologist, XXIV, 242, pr. syn.

HABITAT.—Canada to District of Columbia; west to Nebraska.

Walker's type is in the British Museum and Dr. Riley's specimens are in the National Museum. The species has an economic bibliography not included here.

X. laticinerea Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 27, *Lithophane.*
1882. Riley, Papilio, II, 102, an var. *antennata.*
1883. Hy. Edw., Papilio, III, 135, larva.
1891. Butler, Entomologist, XXIV, 242, =*antennata.*

HABITAT.—With *antennata.*

The type is in the British Museum.

X. grotei Riley.*

1882. Riley, Papilio, II, 102, an var. *antennata.*
1887. Grote, Can. Ent., XIX, 54, *Lithophane.*
cinerosa, ‖ Grt.
1879. Grt., Bull. Geol. Surv., V, 202, *Lithophane.*
1882. Riley, Papilio, II, 102, *nomen bis lectum.*

HABITAT.—With *antennata.*

Mr. Grote's type is in the British Museum. Dr. Riley's name has the same type. I keep the names *antennata*, *laticinerea*, and *grotei* as representing distinct species, pending a critical study of the genus. It is not at all impossible that distinctive characters can be found which need not be "imagined," as Mr. Butler suggests they would be.

X. unimoda Lint.*

1878. Lint., Ent. Cont., IV, 96, *Xylina.*

HABITAT.—Canada; New York in October; Vermont; Northern and Eastern States.

The type is in the Hill collection.

X. tepida Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 27, *Lithophane.*

HABITAT.—Massachusetts; New York; Northern and Eastern States.

A type is in the British Museum; another in the Tepper collection.

X. baileyi Grt.*

1877. Grt., Can Ent., IX, 86, *Lithophane.*

HABITAT.—New York.

The type is in the British Museum.

X. querquera Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 34, *Lithophane.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. I, f. 5, *Lithophane.*
1882. Grt., Ill. Essay, 57, pl. 2, f. 21, *Lithophane.*

HABITAT.—Missouri; New York.

The type is in the British Museum.

X. viridipallens Grt.

1877. Grt., Can. Ent., IX, 215, *Lithophane.*
1878. Grt., Bull. Geol. Surv., IV, 180, *Lithophane.*
1882. Grt., Ill. Essay, 57, pl. 2, f. 22, *Lithophane.*

HABITAT.—Massachusetts; New York.

A type is in the British Museum; another is in Dr. Thaxter's collection.

X. lepida Lint.*

1878. Lint., Ent. Cont., IV, 95, *Xylina.*
1878. Grt., Bull. Geol. Surv., IV, 181, *Lithophane.*

HABITAT.—Canada; Maine; New York.

The type is in the Hill collection.

X. thaxteri Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 196, *Lithophane.*
1875. Grt., List Noctuidæ, pl. f. 3, *Lithophane.*
1876. Speyer, Stett. Ent. Zeit., 1876, 203, an var. *lambda.*
1878. Lint., Ent. Cont., IV, 127, an var. *lambda.*
1882. Grt., Proc. Am. Phil. Soc., XXI, 160, ? an var. *conformis.*
1891. Butler, Entomologist, XXIV, 263,=*lambda.*

HABITAT.—Canada; Maine; Massachusetts; New York.

The type is in the British Museum. There is very good authority for making this a synonym or at least a variety of *lambda;* but I do not feel ready to admit the identity without a more critical study than has yet been made.

X. pexata Grt.*

1874. Grt., 6th Rept. Peab. Ac. Sci., 35, *Lithophane.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 10,=*ingrica.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 160, ?=*ingrica.*
var. **washingtonia** Grt.
1883. Grt., Papilio, III, 74, *Lithophane.*

HABITAT.—Canada; Northern, Eastern, and Middle States; Washington.

The type of the species is in the British Museum; that of the variety is with Mr. Neumœgen.

X. capax G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 355, pl. 7, f. 57, *Xylina.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 145, *Anytus.*
1878. Grt., Bull. Geol. Surv., IV, 180, *Lithophane.*

HABITAT.—Canada; Northern, Eastern and Middle States; Colorado.

A specimen marked type, by Mr. Grote, is in the British Museum. The species is certainly not a *Xylina*, but seems to be congeneric with *Polia acutissima*. As the latter is not a *Polia*, nothing would be gained in accuracy by getting *capax* into that genus at present.

X. carbonaria Harv.*

1876. Harv., Can. Ent., VIII, 55, *Lithophane.*

HABITAT.—Oregon; California; Colorado.

The type is in the Hy. Edwards collection. This also must be removed from *Xylina*, the species affording a quite remarkable structural character.

X. patefacta Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1733, *Xylina*.

HABITAT.—Canada.

The type is at Oxford, in the Saunders collection.†

Genus NYSTALEA Gn.

1852. Gn., Spec. Gen., Noct., II, 122.

N. indiana Grt.

1884. Grt., Papilio, IV, 7, *Nystalea*.
1891. Smith, List Lepidoptera, 50, an *Bombycia* ?

HABITAT.—Indian River, Florida.

The type is in Mr. Neumœgen's collection. I have seen it and believe it a *Bombycia*, but have not had an opportunity of studying the specimen. It is certainly not a *Nystalea*, of which I saw several species in the Berliner Museum.

Genus MORRISONIA Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 53.

The genera *Morrisonia* and *Xylomiges* have been monographically treated by me in the Proc. U. S. National Museum for 1892, vol. XV, pp. 64–86. All the species are there described; but specific reference to this paper is here made only when necessary to accredit a species or authenticate a generic change.

M. mucens Hbn.*

1816. Hbn., Verzeichniss, 243, *Septis*.
1825. Hbn., Zutræge, III, 25, f. 415, 416, *Septis*.
1852. Gn., Spec. Gen., Noct., I, 142, *Xylophasia*.
1856. Wlk., C. B. Mus., Het., IX, 177, *Xylophasia*.
1861. H. Sch., Corr. Blatt, II, 74, *Xylomiges*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 110, *Hadena*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 28, *Xylomiges*.
1879. Grt., Can. Ent., XI, 206, *Mamestra*.
1880. Grt., Can. Ent., XII, 117, *Mamestra*.
1892. Smith, Proc. U. S. Nat. Mus., XV, 79, *Morrisonia*.
spoliata Wlk.
1857. Wlk., C. B. Mus., Het., XI, 759, *Xylina*.

HABITAT.—Middle, Southern, and Central States; Texas, March 10 to April 2; Missouri, March 25 to April 19.

The type of *spoliata* is in the British Museum and is this common Southern species. The locality given was "East Florida."

M. rileyana Smith.*

1890. Smith, Ent. Amer., VI, 212, *Morrisonia*.

HABITAT.—Missouri in April; Texas in March.

The type is in the National Museum.

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† Mr. Schaus has sent me a figure which proves the species a good one, allied to *innominata* m., (signosa‡ Grt.). I have a specimen from Canada.

M. bisulca Grt.*

1881. Grt., Can. Ent., xiii, 230, *Mamestra.*
1891. Smith, List Lepidoptera, 50, *Morrisonia.*

HABITAT.—Arizona.

Types are in the Neumœgen collection and in the British Museum.

M. sectilis Gn.*

1852. Gn., Spec. Gen., Noct., i, 141, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., ix, 177, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 109, *Hadena.*
1891. Butler, Entomologist, xxiv, 264, = *mucens.*
evicta Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 84, pl. ii, f. 18, *Cloantha.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 16, *Actinotia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 53, *Morrisonia.*
var. **vomerina** Grt.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 84, pl. ii, f. 17, *Cloantha.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 16, *Actinotia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 53, *Morrisonia.*
1879. Grt., Can. Ent., xi, 207, an var. pr. ?
1890. Grt., Revised Check List, 24, pr. var.

HABITAT.—Middle and Central States; Canada, New York, and New Jersey, in April and May; Illinois, April and October.

All the types are in the British Museum. Mr. Butler has erroneously referred *sectilis* to *mucens.* The type is a poor specimen of the normal form of *evicta.* It would have been utterly impossible to recognize this species from the description alone.

M. peracuta Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., ii, 114, *Morrisonia.*

HABITAT.—California or Texas.

Types are in the National Museum and in the Tepper collection. My notes indicate that there is another specimen marked "type" in the British Museum. All are without definite locality.

M. infidelis Grt.

1879. Grt., Can. Ent., xi, 206, *Morrisonia.*

HABITAT.—Michigan.

The type is in the British Museum, and seems t agreeing fairly well with the description.

M. confusa Hbn.*

1816. Hbn., Verzeichniss, 243, *Auchmis.*
1823. Hbn., Zutraege, iii, 495, 496, *Auchmis.*
1852. Gn., Spec. Gen., Noct., i, 142, *Xylophasia.*
1856. Wlk., C. B. Mus., Het., ix, 178, *Xylophasia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 110, *Hadena.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 12, *Mamestra.*
1880. Grt., Can. Ent., xii, 118, *Mamestra.*

1892. Smith, Proc. U. S. Nat. Mus., xv, 85, *Morrisonia.*
infructuosa Wlk.
1857. Wlk., C. B. Mus., Het., xi, 627, *Xylina.*
multifaria Wlk.
1857. Wlk., C. B. Mus., Het., xi, 628, *Xylina.*

HABITAT.—Canada to Texas to California. United States generally; Eastern States in April and May.

Walker's types are in the British Museum, and are more or less imperfect specimens of this common species.†

Genus **XYLOMIGES** Gn.

1852. Gn., Spec. Gen., Noct., i, 147.

X. hiemalis Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 71, *Xylomiges.*
californica Behr.
1874. Behr, in Strk. Lep. Rhop. et Het., 94, *Dryobota.*
1876. Grt., Can. Ent., viii, 26, pr. syn.
1878. Grt., Bull. U. S. Geol. Surv., iv, 178, *Xylomiges.*
1879. Grt., Can. Ent., xi, 29, pr. syn

HABITAT.—California in January.

The type is in the British Museum.

X. peritalis Smith.

1892. Smith, Proc. U. S. Nat. Mus., xv, 68, *Xylomiges.*

HABITAT.—Colorado; Oregon.

The type is in the Neumœgen Collection.

X. simplex Wlk.*

1865. Wlk., C. B. Mus., Het., xxxii, 618, *Acronycta.*
crucialis Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., ii, 277, *Xylomiges.*

HABITAT.—Vancouver; California; Colorado in May and October; Portland, Oregon, April and May.

The types of both names are in the British Museum. I failed to see the type of *simplex* in the British Museum, as it was not ranged among the true noctuids of Mr. Butler's first study. Afterward, Mr. Butler very kindly sent me a figure of the species which made it certain that it was no *Acronycta*, but was too sketchy to make out positively. Yet later Mr. Butler stumbled on *Xylomiges crucialis* Harv., and recognized in it Walker's *Acronycta simplex.*

X. curialis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 143, *Xylomiges.*

HABITAT.—California in March.

The type is in the Museum of Comparative Zoölogy at Cambridge.

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† See note on p. 174.

X. dolosa Grt.*

1880. Grt., Can. Ent., xii, 88, *Xylomiges.*

HABITAT.—Maine; Plattsburgh, New York; White Mts., New Hampshire; Colorado.

The type is in the British Museum.

X. rubrica Harv.*

1878. Harv., Can. Ent., x, 58, *Graphiphora.*
1882. Grt., New Check List, 31, *Xylomiges.*
1887. Smith, Proc. U. S. Nat. Mus., x, 462, *Mamestra.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 72, *Xylomiges.*

HABITAT.—California in May; Oregon in May.

The type is in the British Museum.

X. perlubens Grt.*

1881. Grt., Can. Ent., xiii, 132, *Xylomiges.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 71, *Xylomiges.*
subapicalis Smith.
1887. Smith, Proc. U. S. Nat. Mus., x, 462, *Mamestra.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 73, *Xylomiges.*

HABITAT.—Colorado; Washington; California in June; Portland, Oregon, April and May.

Mr. Grote's type is in the British Museum and is like my *subapicalis*, the type of which is in the National Museum. I suspected the identity of the two, but could not make Mr. Grote's description fit sufficiently well to risk the identification.

X. ochracea Riley.*

1892. Riley, Proc. U. S. Nat. Mus., xv, 74, *Xylomiges.*

HABITAT.—California, October, November.

The types are in the U. S. National Museum.

X. patalis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 144, pl. iv, f. 11, *Xylomiges.*
fletcheri Grt.
1888. Grt., Can. Ent., xx, 130, *Xylomiges.*
1891. Smith, List Lepidoptera, 50, pr. syn.

HABITAT.—Vancouver; California in April, May, June, and November.

The type of *patalis* is in the Museum of Comparative Zoölogy at Cambridge; that of *fletcheri* I have not seen; but there is a specimen under this name received from Mr. Fletcher as typical, in the National Museum, which is not in the least different from typical *patalis*.

X. tabulata Grt.

1878. Grt., Bull. U. S. Geol. Surv., iv, 181, *Xylomiges.*
1892. Smith, Proc. U. S. Nat. Mus., xv, 76, ? *Xylomiges.*

HABITAT.—New York.

The types are in the British Museum and in the Hill collection. Both are females and look like a *Mamestra* allied to *anguina*. It will require decide the generic location.

Genus **LITHOMIA** Hbn,
1816. Hbn., Verzeichniss, 244.

L. germana Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 192, *Calocampa*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 198, *Lithomia*.
1878. Græf, Bull. Bkln. Ent. Soc., I, 10, =*solidaginis*.
1883. Grt., Proc. Am. Phil. Soc., XIX, 160, =*solidaginis*.
solidaginis ‡ Wlk.
1857. Wlk., C. B. Mus., Het., XI, 618, 759, *Lithomia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 27, *Calocampa*.

HABITAT.—Hudson Bay Territory; Northern and Eastern States; New York, September.

I have not seen the type, nor do I know where it is at present. It may be that the American is the same as the European species; but I am not sufficiently convinced of it to make the reference.

Genus **PLEROMA** Smith.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 113.

P. obliquata Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 114, *Pleroma*.

HABITAT.—Colorado; Sierra Nevada, California.

The type is in the National Museum; duplicates are in the Edwards and Neumœgen collections.

P. conserta Grt.

1881. Grt., Papilio, I, 58, *Valeria*.

HABITAT.—Washington.

The type is in the British Museum. It is an ally of my species, but more suffused with blackish than any specimen I have seen. The type of maculation is identical and the relationship is close.

Genus **CALOCAMPA** Steph.
1829. Steph., Ill. Brit. Ent., Haust., II, 174.

C. nupera Lint.*

1874. Lint., Bull. Buff. Soc. Nat. Sci., II, 188, *Calocampa*.
1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 190, *Calocampa*.
1878. Thaxter, Psyche, II, 122, larva.
vetusta ‡ Wlk.
1857. Wlk., C. B. Mus., Het., XI, 619, *Calocampa*.
1874. Grt., 6th Rept. Peab. Ac. Sci., 22, *Calocampa*.
1874. Lint., Bull. Buff. Soc. Nat. Sci., II, 180, pr. syn.

HABITAT.—Hudson Bay territory, southward to District of Columbia, west to Nebraska, April, May, September, October.

The type is in Dr. Lintner's collection.

C. cineritia Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 210, *Calocampa.*
1882. Grt., Illustrated Essay, 58, pl. 2, p. 23, *Calocampa.*
var. **thoracica** Put. Cram.
1886. Putman-Cramer, Ent. Amer., II, 142, var. pr.

HABITAT.—Canada; New Hampshire; New York, April
west to Colorado; Portland, Oregon, April and May.

The type of the species is in the British Museum; that
riety is now in Mr. Doll's collection, I believe.

C. brucei Smith.*

1892. Smith, Ent. News, III, 252, pl. X, *Calocampa.*

HABITAT.—Colorado, front range of Rocky Mountains.

The types are in the National Museum and in the Rutgers
collection.

C. curvimacula Morr.*

1874. Morr., Bull. Buff. Soc. Nat. Sci., II, 191, *Calocampa.*
1878. Thaxter, Psyche, II, 122, larva.

HABITAT.—Canada; Northern and Eastern States; New Y
and September; Portland, Oregon, in April.

I have not seen the type and do not know where it is at pre

Genus CLEOPHANA Bdv.

1832. Bdv., Chen. d'Europe, 151.

C. eulepis Grt.

1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 86, *Cleophana.*
1876. Grt., Stett. Ent. Zeit., XXXVII, 136, *Cleophana.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 161, *Cleophana.*

HABITAT.—Oregon; California.

The type is in the Hy. Edwards collection.

C. antipoda Strck.*

1875. Strck., Lep. Rhop. et Het., 129, *Cucullia.*
1880. Grt., Can. Ent., XII, 217, *Cleophana.*

HABITAT.—Colorado; Arizona.

The type is in the Strecker collection.

Genus CUCULLIA Schrank.

1802. Schrank, Fauna Boica, II, 157.

A monographic revision of this genus will be found in the Proc
U. S. National Museum for 1892, vol. XV, pp. 32–51, where all the
are fully discussed [illegible]ference to this paper is made only wher
sary to accredit a [illegible] authenticate a change.

[illegible]vexipennis G. & R.*

1868. Grt. & R[illegible] Ent. Soc., II, 201, pl. III, f. 76, *Cucullia.*
1869. Bethune, [illegible] *Cucullia.*
1874. Lintner, [illegible] 138, 170, *Cucullia.*

HABITAT.—Canada; New York in July and August, to Pennsylvania; Ohio; Delaware in August.

I have not seen the type; but the species is unmistakable.

C. montanæ Grt.*

1882. Grt., Can. Ent., XIV, 175, *Cucullia.*

HABITAT.—Colorado in June; Montana.

The type is in the Neumœgen collection.

C. similaris Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 40, *Cucullia.*

HABITAT.—Colorado, 6,500 feet; Denver in June.

The type is in the National Museum.

C. obscurior Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 40, *Cucullia.*

HABITAT.—Colorado.

The type is in the National Museum.

C. asteroides Gn.*

1852. Gn. Spec. Gen., Noct., II, 133, *Cucullia.*
1857. Wlk., C. B. Mus., Het., XI, 656, *Cucullia.*
1874. Lintner, Ent. Cont., III, 139, 169, *Cucullia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 154, *Cucullia.*

HABITAT.—Canada to Virginia to Nebraska. New York in May, June, July, and August; New Jersey in May; Washington, D. C., in August; Nebraska in May.

A type is in the British Museum.

C. postera Gn.*

1852. Gn., Spec. Gen., Noct., II, 133, *Cucullia.*
1857. Wlk., C. B. Mus., Het., XI, 656, *Cucullia.*
1874. Lintner, Ent. Contr., III, 169, *Cucullia.*

HABITAT.—New Hampshire, July; New York, July; New Jersey.

The type is in the British Museum.

The distribution is probably coincident with that of *asteroides.*

C. florea Gn.*

1852. Gn., Spec. Gen., Noct., II, 133, *Cucullia.*
1857. Wlk., C. B. Mus., Het., XI, 656, *Cucullia.*
1874. Lintner, Ent. Cont., III, 169, *Cucullia.*

HABITAT.—With *postera* and at same dates.

The type is in the British Museum.

C. lætifica Lint.*

5. Lintner, in Grote's Check List Noct., 24, *Cucullia.*
Lintner, Ent. Cont., IV, 98, *Cucullia.*

cita Grt.
1883. Grt., Papilio, III, 75, *Cucullia*.
1892. Smith, Proc. U. S. Nat. Mus., XV, 44, pr. syn.
hartmanni French
1888. French, Can. Ent., XX, 69, *Cucullia*.
1892. Smith, Proc. U. S. Nat. Mus., XV, 44, pr. syn.

HABITAT.—Arizona; Texas in April.

Dr. Lintner's types are in the National Museum and in his own collection; the type of *cita* is in the Neumoegen collection, while that of *hartmanni* is with Prof. French.

C. speyeri Lint.*

1874. Lintner, Ent. Cont., III, 168, figs. 13 and 14, *Cucullia*.

HABITAT.—Canada to Pennsylvania; west to Nebraska; New York, June and August; Nebraska in May.

Types are in Dr. Lintner's collection.

C. dorsalis Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 46, *Cucullia*.

HABITAT.—Colorado, Denver in June, Glenwood Springs in September.

The type is in the National Museum.

C. bistriga Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 47, *Cucullia*.

HABITAT.—Colorado.

Types are in the Neumoegen collection and in the National Museum.

C. intermedia Speyer.*

1870. Speyer, Stett. Ent. Zeit., XXXI, 400, *Cucullia*.
1872. Lintner, Ent. Cont., I, 81, 85, pl. VIII, figs. 5, 7, *Cucullia*.
1874. Lintner, Ent. Cont., III, 170, *Cucullia*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 155, *Cucullia*.
1878. Lintner, Ent. Cont., IV, 125, *Cucullia*.
umbratica‡ Gn.
1852. Gn., Spec. Gen., Noct., II, 147, *Cucullia*.
1870. Speyer, Stett. Ent. Zeit., XXXI, 400, pr. syn.

HABITAT.—Canada to Virginia; Central States; New York in May, July, and August; Delaware in August.

I have not seen the type.

C. cinderella Smith.*

1892. Smith, Proc. U. S. Nat. Mus., XV, 48, *Cucullia*.

HABITAT.—Colorado, Glenwood Springs in September.

The type is in the National Museum.

C. serraticornis Lint.*

1874. Lintner, Ent. Cont., III, 174, *Cucullia*.
1875. Lintner, in Grote's Check List Noct., pl., fig. 10, *Cucullia*.

1883. Grt., Proc. Am. Phil. Soc., XXI, 161, *Cucullia.*
matricaria Behr.
1874. Behr, in Strk., Lep. Rhop. et Het., 94, *Cucullia.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 218, pr. syn.

HABITAT.—California.

The type is in Dr. Lintner's collection.

C. solidaginis Behr.

1874. Behr, in Strk. Lep. Rhop. et Het., 94, *Cucullia.*
1892. Smith, Proc. U. S. Nat. Mus., XV, 51, *Cucullia.*

HABITAT.—California.

I have not seen the type and have not been able to identify the species satisfactorily.

Genus **EUTELIA** Hbn.

1816. Hbn., Verzeichniss, 259.

E. pulcherrima Grt.

1865. Grt., Proc. Ent. Soc. Phil., IV, 326, *Ripogenus.*
1882. Grt., Can. Ent., XIV, 183, *Ripogenus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 161, *Ripogenus.*
dentifera Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 818, *Eutelia.*

HABITAT.—New York; New Jersey.

The types are in the British Museum, and refer to the same species. Both names were published in 1865, but I think Mr. Grote's name antedates the other somewhat. At all events it is the most meritorious. Mr. Neumœgen also has "type" specimens.

Genus **MARASMALUS** Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 89.

M. inficita Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 818, *Eutelia.*
histrio Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 297, *Marasmalus.*

HABITAT.—Canada to Texas; west to Nebraska; Colorado, June and July; Kansas in July.

Both types are in the British Museum and refer to the same species. This time Mr. Walker has the clear priority.

M. ventilator Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 89, *Marasmalus.*
1879. Grt., Can. Ent., XI, 179, *Marasmalus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 162, *Marsamalus.*

HABITAT.—With the preceding, June and July.

The type is in the British Museum. This is the larger and brighter of the two species.

Genus INGURA Gn.

1852. Gn., Spec. Gen., Noct., II, 309.

I. declinata Grt.*

1879. Grt., Can. Ent., XI, 208, *Ingura*.

HABITAT.—California in August; Colorado.

The type is in the British Museum.

I. delineata Gn.*

1852. Gn., Spec. Gen., Noct., II, 311, *Ingura*.
1857. Wlk., C. B. Mus., Het., XII, 857, *Ingura*.

HABITAT.—Canada to Alabama, to Illinois; Missouri; Massachusetts in July.

The species is described after a drawing by Abbott, which I have not seen. I think there is little doubt of the correctness of the identification which Mr. Grote has made in American collections.

I. abrostoloides Gn.*

1852. Gn., Spec. Gen., Noct., II, 311, *Ingura*.
1857. Wlk., C. B. Mus., Het., XII, 875, *Ingura*.
producta Wlk.
1855. Wlk., C. B. Mus., Het., V, 1031, *Edema*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 29, ? var. *declinata*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 311, ? pr. syn.

HABITAT.—With the preceding, but more rare. July.

I have not seen Guenée's type, which is with Mr. Oberthür. Walker's type is in the British Museum and is the species Mr. Grote has—I think correctly—identified as *abrostoloides*.

I. fuscescens Wlk.*

1855. Wlk., C. B. Mus., Het., V, 1031, *Edema*.
1868. G. & R., Trans. Am. Ent. Soc., II, 73, *Ingura*.
abrostella Wlk.
1866. Wlk., C. B. Mus., Het., XXXV, 1744, ? *Subrita*.
præpilata Grt.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 311, *Ingura*.

HABITAT.—Texas in April and May; Mississippi; New Mexico.

All the types are in the British Museum. Mr. Grote's type is of the Belfrage material, and exact duplicates from the same collector are in the National Museum. Mr. Neumœgen has also a "type" of Mr. Grote's species. Walker's *abrostella* was described as a Crambit.

I. flabella Grt.

1879. Grt., Can. Ent., XI, 208, *Ingura*.

HABITAT.—Kansas.

The type is in the British Museum.

I. oculatrix Gn.*

1852. Gn., Spec. Gen., Noct., II, 313, *Ingura*.
1857. Wlk., C. B. Mus., Het., XII, 875, *Ingura*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 162, *Ingura*.

HABITAT.—Eastern, middle, and central States; Canada; New York in July.

The species was described from the Saunders collection and the type is probably at Oxford. I think there is no doubt of the correctness of the identification made by Mr. Grote.

I. pygmæa Hbn.

1818. Hbn., Zuträge, 21, ff. 109, 110, *Pactes*.
1880. Grt., Can. Ent., XII, 87, *Ingura*.

HABITAT.—Georgia.

This species is not yet identified in our collections so far as I know. I have not tried to compare the figure carefully.

I. cristatrix Gn.

1852. Gn., Spec. Gen., Noct., II, 313, *Ingura*.
1857. Wlk., C. B. Mus., Het., XII, 875, *Ingura*.

HABITAT.—America?

Guenée describes his species as from the Coll. Cie des Indes and suggests that it may be East Indian. But he makes the same suggestion also as to *oculatrix* and it does not mean much positive knowledge. I have not tried seriously to recognize the species.

Genus **ANOMIS** Hbn.

1816. Hbn., Verzeichniss, 249.

A. erosa Hbn.*

1818. Hbn., Zuträge, 19, ff. 287, 288, *Anomis*.
1816. Hbn., Verzeichniss, 249, *Anomis*.
1852. Gn., Spec. Gen., Noct., II, 395, *Cosmophila*.
1880. Grt., Can. Ent., XII, 116, *Anomis*.
1882. Riley, Rept. Ent. Dept. Agl., 1881-'82, 167, pl. 8, f. 1, *Anomis*.
1885. Riley, 4th Rept. U. S. Ent. Comm., 345, pl. II, ff. 1, 2, 3, *Anomis*.

HABITAT.—Massachusetts, in August; District of Columbia and southward; Kansas in September.

Full life histories of this species can be found in the two reports by Dr. Riley, where all stages are acceptably figured. By the dates given it is evident that either the Verzeichniss was not published until 1818, or the names to be given were anticipated in that publication.

A. exacta Hbn.*

1810. Hbn., Saml. Ex. Schmett., II, pl. 411, *Anomis*.
1816. Hbn., Verzeichniss, 249, *Anomis*.
1852. Gn., Spec. Gen., Noct., II, 399, *Anomis*.
1857. Wlk., C. B. Mus., Het., XIII, 989, *Anomis*.
1868. H. Sch., Corr. Blatt, 1868, Cuba, p. 16, *Anomis*.
1885. Riley, 4th Rept. Ent. Comm., 350, *Anomis*.

HABITAT.—Southern United States. ?

Dr. Riley questions Mr. Grote's identification of this species, and calls our American form *texana*. He is probably correct in this; but as I have not studied the question, I give the bibliography necessary to put the student on the track.

A. texana Riley.*

1885. Riley, 4th Rept. Ent. Comm., 350, app. 120, pl. ii, ff. 4, 5, and 6, *Anomis*.

HABITAT.—Texas; Southern United States.

Dr. Riley proposes this name to replace *exacta* Grt., not Hübner. The figure given is excellent, and leaves no doubt as to the species intended. The types are in the National Museum.

A. luridula Gn.*

1852. Gn., Spec. Gen., Noct., II, 401, *Anomis*.
1857. Wlk., C. B. Mus., Het., XIII, 988, *Anomis*.
1868. H-Sch., Corr. Blatt, 1868, Cuba, 16, *Anomis*.
1883. Gundlach, Cont. Ent. Cub., 324, *Anomis*.
1892. Butler, Entomologist, XXV, 12, *Anomis*.
derogata Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 990, *Anomis*.
1892. Butler, Entomologist, XXV, 13, pr. syn.

HABITAT.—Gulf States; West Indies; Venezuela.

Luridula Gn., and *derogata* Wlk., based on typical specimens in the British Museum, are one species. There is not even the varietal difference between them that Mr. Butler seems to suspect, unless very slight difference in maculation makes a variety. Under that definition almost every specimen would be a variety, so I can not quite understand what Mr. Butler's remark (*l. c.*, p. 13) was intended to mean.

A. conducta Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 990, *Anomis*.
1892. Butler, Entomologist, XXV, 13, *Anomis*, = *illita*.
hostia Harv.
1876. Harv., Can. Ent., VIII, 6, *Aletia*.
1892. Butler, Entomologist, XXV, 13, pr. syn.

HABITAT.—Texas.

The types are in the British Museum. The species is much more common in Central and South America, and probably only occasional in the Southern United States. Mr. Butler would see in this the true *Aletia argillacea* of Hübner, and so cites it in the Entomologist, *l. c. supra*. I do not follow Mr. Butler's references to *illita* Gn., because I believe that to be another species. One of the types is in the Jardin de plantes in Paris, while none is in the BritishMuseum. I did not directl compare the specimens, but Guenée's species looked different. I d know that the synonymy above is correct as far as it goes.

Genus **ALETIA** Hbn.

1816. Hbn., Verzeichniss, 239.

A. argillacea Hbn.*

1820. Hbn., Zutraege, ff. 399, 400, *Aletia*.
1856. Wlk., C. B. Mus., Het., IX, 79, *Mythimna*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 122, 170, *Aletia*.
1879. Comstock, Cotton Insects, I, 284, pl. 1, *Aletia*.
1880. Grt., Can. Ent., XII, 117, *Aletia*.
1892. Butler, Entomologist, XXV, 13, *Aletia*.
xylina Say.
1828. Say, Southern Agriculturist, I, 203, *Noctua*.
1859. Say, American Ent., Lec. ed., I, 370, *Noctua*.
1864. Grt., Proc. Ent. Soc. Phil., III, 541, *Anomis*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, pr. syn.
1880. Grt., Can. Ent., XII, 117, pr. syn.
1881. Riley, Papilio, I, 107, an sp. dist.
1885. Riley, 4th Rept. Ent. Comm., pp. 1–344, pl., *Aletia*.
grandipuncta Gn.
1852. Gn., Spec. Gen., Noct., II, 400, *Anomis*.
1857. Wlk., C. B. Mus., Het., XIII, 989, *Anomis*.
1868. Bethune, Can. Ent., I, 87, *Anomis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 24, pr. syn.
bipunctina Gn.
1852. Gn., Spec. Gen., Noct., II, 400, *Anomis*.
1857. Wlk., C. B. Mus., Het., XIII, 980, *Anomis*.
1864. Grt., Proc. Ent. Soc. Phil., III, 541, = *xylina*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, pr. syn.

HABITAT: Canada occasional, south to Central Southern and Gulf States; Central and South America.

I have seen none of the types. *Bipunctina* was described from a figure by Abbot and has no type; *grandipuncta* was described from specimens in the Saunders & Guenée collections. The types are, therefore, probably one of them at Oxford, the others at Rennes with M. Oberthür. The bibliography given is a mere outline. In Comstock's Cotton Report of 1879 and in the 4th Rept. of the United States Entomological Commission a full bibliography covering several pages is given. In these publications all possible information concerning the species will be found. Concerning the synonymy adopted, a few words may be necessary. Prof. Comstock accepted Mr. Grote's dictum on authority, while suggesting that it was not beyond doubt. Dr. Riley does not accept Mr. Grote's identification at all, and goes at some length into the reasons for declining to do so. Unfortunately, with a large material at command, he yet failed to find a species to which he was willing to apply Hübner's figure positively. Mr. Butler says, "I can not admit this identification of *argillacea*," referring to its union with *xylina* Say. He refers to *argillacea*, *illita* Gn., *conducta* Wlk., and *hostia* Harv. *Hostia* and *conducta* are synonymous from my own examination of the types. Of *illita* I am not certain; but I feel very firmly convinced that Hübner did not have this form before him to be figured.

Some four or five years ago I examined, at Dr. Riley's request, a very large series of Anomids, largely South American, in comparison with a number of type specimens from the Paris collections and with the descriptions of all the species. The material was larger than any I have seen elsewhere or since, and after the most careful comparisons I then concluded that Hübner could have had no other than Say's *xylina* before him as original to his figure. There are certain specific characters that are seen in *xylina* and in no other species, and these characters are given by Hübner. The figure is bad and the color is bad; but neither are worse than a hundred others which are accepted unquestioned, and the specific features given are those of *xylina* and of no other species. The very great majority of early figures are no more accurate than is Hübner's *argillacea*, but where there are not closely related species the matter is immaterial. In this instance I believe Mr. Grote most clearly in the right.

Genus **PTERÆTHOLIX** Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 298.

P. bullula Grt.*

1873. Grt., Trans. Am. Ent. Soc., IV, 299, *Pteræthollix.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 163, *Pteræthollix.*

HABITAT.—Alabama and Southern States; Texas in October to December.

The specimen in the British Museum does not seem to be the type; but is from the Grote collection and is the same as the specimens so named in the National Museum. Mr. Butler says, Entomologist XXV, 11, that this is the same genus as *Berresa* Wlk., Het. XVI, 214. I did not see the specimens and am not ready to accept the reference.

Genus **AMYNA** Gn.

1852. Gn., Spec. Gen., Noct., I, 406.

A. orbica Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 216, *Segetia.*
tecta Grt.
1876. Grt., Can. Ent., VIII, 190, *Chytoryza.*
1878. Grt., Can. Ent., X, 233, *Chytoryza.*
1891. Smith, List Lepidoptera, 51, pr. syn.

HABITAT.—Texas; Kansas in October.

Somewhere I have seen Mr. Morrison's type, which is the same species as Mr. Grote's type of *tecta* in the British Museum. It is quite likely that Mr. Morrison's name must eventually sink in favor of one of the Guenèe or Walker names In the British and other European museums are a number of Central and South American species, very closely allied, which much resemble our own insect. In fact there were so many names and so little difference in the specimens that I felt unwilling to identify the Texan form with any of them. *Ilattia* is another generic synonym.

Genus **LITOPROSOPUS** Grt.

1869. Grt., Trans. Am. Ent. Soc. ii, 309.

L. futilis G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., ii, 202, pl. iii, f. 73, *Dyops.*
1869. Grt., Trans. Am. Ent. Soc., ii, 309, *Litoprosopus.*
1881. Grt., Bull. Geol. Surv., vi, 271, *Litoprosopus.*
1883. Grt., Proc. Am. Phil. Soc., xxi, 163, *Litoprosopus.*

HABITAT.—Florida; Georgia.

I have not seen the type, nor do I know where it is.

L. confligens Wlk.

1857. Wlk., C. B. Mus., Het., xii, 856, *Dyops.*
1869. Grt., Trans. Am. Ent. Soc., ii, 309, *Litoprosopus.*

HABITAT.—West Indies; Central and South America.

The type is in the British Museum. I have seen no specimens from our fauna, nor do I find any record of such. I follow Mr. Grote in listing it, without a knowledge of why he did so. He also lists *hatuey* Poey, but this is explained by him and the species is not claimed from fauna.

Genus **DIASTEMA** Gn.

1852. Gn., Spec. Gen., Noct., ii, 317.

D. tigris Gn.

1852. Gn., Spec. Gen., Noct., ii, 317, *Diastema.*
1857. Wlk., C. B. Mus., Het., xii, 879, *Diastema.*
1892. Butler, Entomologist, xxv, 11, *Nipista.*
lineata Wlk.
1857. Wlk., C. B. Mus., Het., xii, 800, *Nipista.*
1892. Butler, Entomologist, xxv, 11, pr. syn.

HABITAT.—Florida.

Both types are in the British Museum, and Mr. Butler is correct in uniting them. He thinks *tigris* not congeneric with *Diastema virgo* and therefore adopts Walker's generic name. My ideas of genera do not always agree with Mr. Butler's, and I prefer therefore to retain Guenée's genus until I can make comparisons myself.

Genus **OGDOCONTA** Butler.

1891. Butler, Ann. & Mag. Nat. Hist., 1891, 462.

O. cinereola Gn.*

1852. Gn., Spec. Gen., Noct., ii, 316, pl. 15, f. 1, *Placodes.*
1853. H. Sch., Lepid. Exot., 68, f. 215, *Placodes.*
1856. H. Sch., Schmett. Eur., Index, *Telesilla.*
1857. Wlk., C. B. Mus., Het., xii, 878, *Placodes.*
1874. Grt., Can. Ent., vi, 16, *Telesilla.*
1880. Coquillett, No. Amer. Ent., i, 52, larva.
1891. Butler, Ann. and Mag. Nat. Hist., 1891, 462, *Ogdoconta.*
atomaria Wlk.
1865. Wlk., C. B. Mus., Het., xxxii, 675, *Miana.*
1882. Grt., Ill. Essay, 44, pr. syn.

HABITAT.—Canada to Texas to Minnesota; Nebraska. Canada in

June; New York, June, July, August; Illinois, August and September; Texas in April; Delaware in June.

The types are in the British Museum. Mr. Butler's characters for the genus seem good. *Naria* Harvey, belongs to *Stibadium*.

O. carneola Smith.

1891. Smith, Trans. Am. Ent. Soc., xviii, 110, *Telesilla*.
1891. Smith, List Lepidoptera, 51, *Ogdoconta*.

HABITAT.—Las Vegas, New Mexico.

The type is in the Neumœgen collection.

Genus **BEHRENSIA** Grt.

1875. Grt., Can. Ent., vii, 70.

B. conchiformis Grt.

1875. Grt., Can. Ent., vii, 71, *Behrensia*.
1875. Grt., List Noctuidæ, pl., f. 6, *Behrensia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 164, *Behrensia*.

HABITAT.—California; Portland, Oregon, April and May.

The type is in the British Museum. The species is one I had never seen before and is one of the most beautiful of our noctuids. I have since seen several specimens, all taken at light, and all of them in such poor condition that the brilliancy of the species could not be appreciated.

Genus **ABROSTOLA** Ochs.

1816. Ochs., Schmett. Eur., iv, 88.

A. ovalis Gn.

1852. Gn., Spec. Gen., Noct., ii, 322, *Abrostola*.
1857. Wlk., C. B. Mus., Het., xii, 883, *Abrostola*.

HABITAT.—Canada in August; New York; New Jersey; Pennsylvania; Massachusetts in June and August.

The type is in the British Museum.

A. urentis Gn.*

1852. Gn., Spec. Gen., Noct., ii, 322, pl. 11, f. 11, *Abrostola*.
1857. Wlk., C. B. Mus., Het., xii, 883, *Abrostola*.
1875. Speyer, Stett. Ent. Zeit., xxxvi, 159, *Abrostola*.

HABITAT.—Nova Scotia, southward to District of Columbia; Middle and Central States, July and August.

The type is in the British Museum.

Genus **DEVA** Wlk.

1857. Wlk., C. B. Mus., Het., xii, 962.

D. purpurigera Wlk.*

1858. Wlk., C. B. Mus., Het., xiv, 1791, *Deva*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 30, *Plusia*.
1881. Grt., Papilio, i, 35, *Deva*.

HABITAT.—Canada; New York; Colorado; New Mexico; Eastern and Northern States, June, July, August.

The type is in the British Museum.

D. palligera Grt.

1881. Grt., Papilio, I, 35, *Dera*.

HABITAT.—Sierra Nevada, California; Western Colorado.

Types are in the Edwards Collection and in the British Museum.

D. morigera Hy. Edw.

1887. Hy. Edw., Ento. Amer., II, 169, *Dera*.

HABITAT.—South Park, Colorado.

The type is in the Edwards Collection.

Genus **PLUSIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 89.

Mr. Grote in his lists writes *Plusia* Fabricius, and in 1874 quoted Lederer as authority for this use. Lederer, however, says *Plusia* Treitschke; but says also *Plusia* Fabricius, for a section of the genus including those not referable to *Abrostola*; Staudinger writes *Plusia* Ochsenheimer, and this accords with what I have found in my searches among the ancients. In none of the Fabrician works is *Noctua* subdivided, though probably in the Systema Glossatorum this was done. It may be that Lederer derives his authority from this unpublished work; but as the matter stands Ochsenheimer must be credited with the genus.

P. ærea Hbn.*

1810. Hbn., Schmett. Eur., IV, pl. 56, f. 27, *Noctua*.
1811. Oliv., Enc. Meth., VIII, 318, *Noctua*.
1816. Hbn., Verzeichniss, 250, *Agrapha*.
1827. Dup., Hist. Nat. Lep. Fr., VII, 17, pl. 133, f. 4, *Noctua*.
1829. Bdv., Index Meth., 159, *Plusia*.
1832. Meigen, Syst. Beschr. Schmett. Eur., III, 250, pl. 121, f. 5, *Plusia*.
1852. Gn., Spec. Gen., Noct., II, 333, *Plusia*.
1857. Wlk., C. B. Mus., Het., XII, 890, *Plusia*.

HABITAT.—Nova Scotia, south to Florida and Texas; United States east of the Rocky mountains; New Mexico; Colorado; Canada in June and August; New York in June, August, and September; Massachusetts in July; District of Columbia in August.

This species was described as European, which accounts for the character of the bibliography. Guenée first pointed out that it was an American. Curiously enough there has been no reference requiring citation in American works.

P. æroides Grt.*

1864. nt. Soc. Phil., III, 83, et 541, pl. 2, f. 5, *Plusia*.
Cont., III, 164, larva.
he, I, 188, larva.

H to Texas, to Colorado. Dates as in *ærea*.

T ltish Museum.

P. balluca Geyer.*

1835. Geyer, Zuträge, ff. 681, 682, *Dyachrysia.*
1852. Gn., Spec. Gen., Noct., II, 334, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII, 904, *Plusia.*
1873. Saund., Can. Ent., v, 11, larva.
1874. Lintner, Ent. Cont., III, 163, larva.
1881. Grt., Can. Ent., XIII, 91, *Plusia.*

HABITAT.—Nova Scotia; Canada in June and July; Northern, Eastern and Middle States in July and August.

P. metallica Grt.*

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 311, *Plusia.*
bractea ‡ Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 72, *Plusia.*
1875. Grt., Can. Ent., VII, 46, *Plusia.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 311, pr. syn.

HABITAT.—California, Mendocino in June.

The type is in the British Museum.

P. arizona French.

1889. French, Can. Ent., XXI, 161, *Plusia.*

HABITAT.—Arizona.

The type is in Prof. French's collection. If it is as close an ally of *P. howardi* Edw., as Prof. French suggests, it is not a *Plusia* at all, but a *Basilodes.* I have not seen it.

P. contexta Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 193, *Plusia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 161, *Plusia.*
1883. Thaxter, Papilio, III, 18, larva on grass.

HABITAT.—Maine; New York; Eastern and Middle States, June, July, August. A type is in the British Museum; another in Dr. Lintner's collection.

P. putnami Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 146 et. 192, pl. 4, f. 2, *Plusia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 162, *Plusia.*

HABITAT.—Northern, Eastern, and Middle States; Canada; June and July; Colorado; Virginia; Portland, Oregon, May and June.

The type is in the British Museum.

P. venusta Wlk.

1865. Wlk., C. B. Mus., Het., XXXIII, 836, *Plusia.*
striatella Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 194, *Plusia.*

HABITAT.—Canada; Maine; New York; District of Columbia.

The type of Walker's species is in the British Museum, as is also a specimen of *striatella*—not the type—from the Grote collection. The two refer to the same species.

P. formosa Grt.*

1865. Grt., Proc. Ent. Soc. Phil., iv, 323, *Leptina*.
1875. Morr., Ann. Lyc. Nat. Hist. N. Y., xi, 98, *Plusia*.

HABITAT.—Maine; Massachusetts in July; New York; New Jersey.

I have not seen the type. Mr. Grote mentions incidentally in the Can. Ent., xxi, 124, that he returned it to Mr. Treat after description. What became of it afterward, I can not say. The species is well known, however, though rare, and can not be mistaken.

P. thyatiroides Gn.*

1852. Gn., Spec. Gen., Noct., ii, 337, pl. 11, f. 8, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 905, *Plusia*.

HABITAT.—New York, August and September; Canada; Northern, Central, and Middle States.

The type is in the British Museum.

P. mappa G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., ii, 204, *Plusia*.
1869. Bethune, Can. Ent., i, 87, *Plusia*.

HABITAT.— Canada in July and August; Northern States; Mount Washington.

I have not seen the type, nor do I know where it is.

P. bimaculata Steph.*

1832. Steph., Ill. Brit. Ent., Haust., iii, 104, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 905, *Plusia*.
u-brevis Gn.
1852. Gn., Spec. Gen., Noct., ii, 341, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 905, ? pr. syn.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 30, pr. syn.
1874. Grt., Can. Ent., vi, 72, pr. syn.
protea Cram.
1782. Cram., Pap. Ex., iv, 244, pl. 400, f. M, *Noctua*.
1857. Wlk., C. B. Mus., Het., xii, 905, ? pr. syn.

HABITAT.—Canada in July and August, to Middle States; New York; New Jersey.

The type of Guenée's species is in the British Museum. The reference to Cramer's species may or may not be correct. I have not examined the matter myself, and simply give the Walker citation. Of course Cramer's name would have priority did it apply to our species.

P. biloba Steph.*

1832. Steph., Ill. Brit. Ent., Haust., iii, 104, *Plusia*.
1852. Gn., Spec. Gen., Noct., ii, 341, pl. 11, f. 10, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 906, *Plusia*.
1882. French, Papilio, ii, 113, life history.

HABITAT.—Massachusetts to Florida, west through the Mississippi States; Texas; Colorado in September; California in April; New York in June and July.

P. verruca Fabr.*

1794. Fabr., Ent. Syst., III, 2, 81, *Noctua*.
1811. Oliv., Encyc. Meth., VIII, 315, *Noctua*.
1852. Gn., Spec. Gen., Noct., II, 342, *Plusia*.
1857. Wlk., C. B. Mus., Het., XII, 906, *Plusia*.
omega Hbn.
1820. Hbn., Zutræge, 29, f. 373, 374, *Argyrogramma*.
1852. Gn., Spec. Gen., Noct., II, 342, pr. syn.
1857. Wlk., C. B. Mus., Het., XII, 906, pr. syn.
oo. Cram.
1782. Cram., Pap. Exot., IV, 45, pl. 311, f. *E*, not *F*., *Noctua*.
1852. Gn., Spec. Gen., Noct., II, 342, pr. syn.
1856. Wlk., C. B. Mus., Het., XII, 906, ? pr. syn.
omicron Hbn.
1816. Hbn., Verzeichniss, 251, *Autographa*.
1857. Wlk., C. B. Mus., Het., XII, 906, pr. syn.
questionis Tr.
1835. Tr., Schmett. Eur., Supplt., 132, *Plusia*.
1840. Bdv., Gen. et Ind. Meth., 158, *Plusia*.
1852. Gn., Spec. Gen., Noct., II, 342, pr. syn.
1857. Wlk., C. B. Mus., Het., XII, 906, pr. syn.

HABITAT.—New York to Florida, Texas, Central and South America; Massachusetts in August; New Jersey in May; Texas in November; Kansas.

The synonymy above is that given by Guenée and after him by Walker. The latter questions *oo* Cramer, as the same, but Guenée seems to consider that Cramer had two species under that name, and cites figure *E* only to this form. Walker makes this the *omicron* of Hübner, nec Linnæus.

P. rogationis Gn.*

1852. Gn., Spec. Gen., Noct., II, 344, *Plusia*.
1857. Wlk., C. B. Mus., Het., XII, 906, *Plusia*.
hamifera Wlk.
1857. Wlk., C. B. Mus., Het., XII, 917, *Plusia*.
dyaus Grt.
1875. Grt., Can. Ent., VII, 202, *Plusia*.

HABITAT.—New York to Texas; Colorado; South America.

In the British Museum are types of *hamifera* and *dyaus*, and these are unquestionably alike. There are also specimens of *dyaus* under *precationis* Wlk.; but there are no specimens of *rogationis* under the label. In the Berliner Museum, however, is a series of South American specimens marked *rogationis* Gn., and among them is a specimen from Boll, Texas, exactly like *dyaus*. Guenée mentions his species as from divers collections, not rare, and gives "Am. Sept." as one of the localities. His comparative description applies perfectly, and though I have not seen absolute types, I make no doubt the Berlin specimens are correctly named and that *dyaus* Grt., is the same species. *Hamifera* is recorded from Brazil and Venezuela, covering thus the localities given by née.

P. culta Lint.

1885. Lintner, 2nd Rept. Ins. New York, 94, *Plusia*.
1891. Smith, List Lepidoptera, 52, =*laticlavia*.

HABITAT.—New York.

The type is in Dr. Lintner's collection.

I was in error in referring this species to *laticlavia* Morrison in the Check list.

P. precationis Gn.*

1852. Gn., Spec. Gen., Noct., II, 344, *Plusia*.
1857. Wlk., C. B. Mus., Het., XII, 907, *Plusia*.
1869. Pack., Guide to Study of Insects, 312, larva.
1882. Coquillett, Can. Ent., XIV, 60, larva.

HABITAT.—Canada; United States east of the Rocky Mountains. May to October.

The type is in the British Museum, where there are three species mixed under this name. The description of the larva cited by Mr. Edwards in his catalogue of early stages applies to *simplex*.

P. egena Gn.

1852. Gn., Spec. Gen., Noct., II, 328, *Plusia*.
1883. Grt., Can. Ent., XV, 26, *Plusia*.

HABITAT.—Indian River, Florida.

The species is described from Brazil. I have not seen the type.

P. labrosa Grt.

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 207, *Plusia*.

HABITAT.—California in August.

The type is in the British Museum.

P. flagellum Wlk.

1857. Wlk., C. B. Mus., Het., XII, 909, *Plusia*.
monodon, Grt.
1875. Grt., Can. Ent., VII, 202, *Plusia*.

HABITAT.—Hudson Bay Territory, Cape Breton; "North America."

The types are in the British Museum and refer to the same species.

P. pseudogamma Grt.

1875. Grt., Can. Ent., VII, 203, *Plusia*.

HABITAT.—Cape Breton.

The type is in the British Museum.

P. gamma Linn.

1761. Linn., Fauna Suec., 1171, *Noctua*.
1767. Linn., Syst. Nat., ed. XII, 2, 843, *Noctua*.
1781. Fabr., Spec. Insect., II, 227, *Noctua*.
1787. Fabr., Mant. Ins., II, 162, *Noctua*.
1793. Fabr., Ent. Syst., III, 2, 79, *Noctua*.
1811. Oliv., Encycl. Meth., VIII, 313, *Noctua*.

1816. Hbn., Verzeichniss, 251. *Autographa.*
1823. Tr., Schmett. Eur., V, 185, *Plusia.*
1837. Kirby, Fn. Bor. Amer., IV, 307. *Plusia.*
1852. Gn., Spec. Gen., Noct., II. 348, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII. 899. *Plusia.*
1874. Strk., Lep. Rhop. et Het., 94, *Plusia.*
1874. Grt., Can. Ent., VI, 16. *Plusia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI. 164. *Plusia.*
1881. Beth., Can. Ent., XIII, 162, *Plusia.*

HABITAT.—Hudson's Bay Territory; Canada; California.

This species is omitted from Mr. Grote's list of 1891, and from my own as well. I believed that the northern type was *pseudogamma* and the western, *californica.* I am not certain now that such is not the case; but as I have not had an opportunity of comparing types I give the species a place pending further study.

P. ou Gn.*

1852. Gn., Spec. Gen., Noct., II, 348, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII. 907. *Plusia.*
1874. Morr., Proc. Bost. Soc. N. H., XVII, 219, *Plusia.*
var. **californica** Spey.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 164, *Plusia gamma* var.
1886. Hy. Edw., Ento. Amer., II, 170, *Plusia.*
var. **russea** Hy. Edw.
1886. Hy. Edw., Ento. Amer., II, 170, var. prec.

HABITAT.—New York; Missouri; Nebraska; Florida; Texas March, May, and November; California, March, April, and August; Colorado in September; Oregon, April, May, and June.

Guenée's type is in the British Museum and the specimens from the Grote collection are like it. *Californica* Speyer is a slight variety of *ou*, and not of *gamma*, as Speyer thought. The California localities for *gamma* are probably based on this species. Dr. Strecker states very positively that his California examples are *gamma*. Mr. Edwards's variety is scarcely worthy a name.

P. fratella Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II. 161, *Plusia.*
1875. Morr., Proc. Bost. Soc. N. H., 1875, 219, = *P. ou.*

HABITAT.—Texas.

The type is in the British Museum. As already stated, Mr. Grote had correctly identified *ou*, and Mr. Morrison's reference of *fratella* is, therefore, incorrect.

P. pedalis Grt.

1875. Grt., Can. Ent., VII, 204, *Plusia.*

HABITAT.—Kansas.

The type is in the British Museum.

P. brassicæ Riley.*

1870. Riley, 2d Rept. Ins. Mo., 110, f. 81, *Plusia*.
1871. Beth., Rept. Ent. Soc. Ont., 1871, 51, f. 93, *Plusia*.
1871. Pack., in Hayden's 9th Rept. Geol. Surv., 752, *f.* a, b, c.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 147, =*ni*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 165, 350, *Plusia*.
1880. Riley, Amer. Ent., III, 200, *Plusia*.
1881. Riley, Index and Supplt., to Mo. Repts., 77, sp. dist.
1881. Riley, Papilio, I, 106, *Plusia*.
1881. Grt., Papilio, I, 127, = *ni*.
1881. Butler, Papilio, I, 170, =*u-aureum*.
1882. Riley, Papilio, II, 43, sp. dist.
1883. Riley, Rept. U. S. Dept. Agl., 1883, 119, pl. I et XI, life hist.
1886. Grt., Can. Ent., XVIII, 232, = *ni*.
ni ‡ Grt.
1873. Grt., Bull. Buff. Soc., Nat. Sci., I, 147, *Plusia*.
1880. Lintner, in Colvin's 7th Rept. Surv. Adir., 399, *Plusia*.
echinocystis Behr.
1874. Behr, in Strk. Lepidopt., 94, *Plusia*.

HABITAT.—United States generally; Canada. Throughout the season.

Dr. Riley's types are in the National Museum. I have not compared the European and American species and give the above as the present status of the literature. Mr. Butler's reference to *u-aureum* Gn., is wild. In the Berliner Museum there is a specimen labeled *echinocystis* Behr, received from Boll, Texas. I am inclined to believe the labeling authentic, and the very brief description is not contradictory in any way. It has been referred, doubtfully, to *pasiphæa;* but this does not agree with what little is said. The economic bibliography is large.

P. oxygramma Geyer.*

1830. Geyer, Zutræge, f. 769, 770, *Autographa*.
1852. Gn., Spec. Gen., Noct., II, 353, *Plusia*.
1857. Wlk., C. B. Mus., Het., XII, 908, *Plusia*.

HABITAT.—Missouri; Georgia; Southern States; Texas.

P. scapularis Hy. Edw.

1882. Hy. Edw., Papilio, II, 127, *Plusia*.

HABITAT.—Washington.

Types are in the Edwards and Neumœgen collections.

P. lenzi French.

1889. French, Can. Ent., XXI, 161, *Plusia*.

HABITAT.—Siskiyou, California.

I have not seen this species. I believe Prof. French has the type.

The species is nominally credited to Dr. Behr, MSS.; but the description is by French, and he must be credited with the species, since he, not Dr. Behr, characterized it.

P. u-aureum Gn.*

1852. Gn. Spec. Gen., Noct., ii, 354, *Plusia*.
1860. Moeschl., Wien. Ent. Monatschr., iv, 371, *Plusia*.
1881. Butler, Papilio, i, 170, *Plusia*.
interrogationis var. *grœnlandica* Stgr.
1857. Stgr., Stett. Ent. Zeit., xxviii, 306, *Plusia*.
1860. Moeschl., Wien. Ent. Monatschr., iv, 371, pr. syn.

Habitat.—Labrador; Greenland; Canada in September; Adirondack Mountains in July.

I have seen no types. The species is credited to "Boisduval in Mus.," but was first described by Gueneé. The types are probably with M. Oberthür.

P. mortuorum Gn.*

1852. Gn., Spec. Gen., Noct., ii, 353, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 910, *Plusia*.

Habitat.—Canada; Northern and Eastern States; New York and New Jersey, July and August.

The type is in the British Museum.

P. octo-scripta Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 72, *Plusia*.
1874. Grt., Can. Ent., vi, 72 (*8-signata*).

Habitat.—Anticosti; Canada in September; Maine; Vermont; Massachusetts in September; New York; Wisconsin.

I have seen no type. I can not find that Sanborn ever described this species, and therefore credit it to Mr. Grote, who did so.

P. falcigera Kirby.

1837. Kirby, Fn. Bor. Amer., iv, 308, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 908, *Plusia*.
1881. Beth., Can. Ent., xiii, 463, *Plusia*.
rectangula Kirby.
1837. Kirby, Fn. Bor. Amer., iv, 306, *Plusia*.
1857. Wlk., C. B. Mus., Het., xii, 908, ? pr. syn.
1881. Beth., Can. Ent., xii, 162, *Plusia*.

Habitat.—Hudson Bay Territory; Nova Scotia; Canada.

The above synonymy is after Walker, and may or may not be correct. Dr. Bethune writes *falcifera* while Walker has it *falcigera*. I have not seen the original description and am not sure which is correct. Mr. Grote, however, also writes *falcigera*, and he has, perhaps, compared the original work. The specimens in the British Museum labeled *falcigera* by Walker are *vaccinii* Hy. Edw.. and do not accord well with the description copied by Dr. Bethune. It is, however, quite likely that the species belongs here.

P. vaccinii Hy. Edw.*

1886. Hy. Edw., Ento. Amer., ii, 170, *Plusia*.

Habitat.—Mt. Washington, N. H.; New York, Adirondack Mountains; Nova Scotia.

The type is with Dr. Thaxter, who pointed out the species to me in the National Museum, where it stood in the Meske collection as *octoscripta*. It much resembles that species. As already stated, this is the *falcigera* of Walker, and possibly that of Kirby as well; but there is sufficient doubt in the matter to prevent their union here.

P. selecta Wlk.*

1857. Wlk., C. B. Mus., Het., XII, 912, *Plusia*.
viridisignata Grt.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 73 (*viridisigma*).
1875. Grt., Bull. Buff. Soc. Nat. Sci., III. 5, *Plusia*.
1875. Grt., Can. Ent., VII, 205, *Plusia*.

HABITAT.—Hudson Bay Territory; Canada in August; Adirondack Mountains, New York; Denver, Colorado.

The types are in the British Museum, and refer to the same species.

P. angulidens Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 111, *Plusia*.

HABITAT.—South Park, Colorado.

Types are in the National Museum, the Neumœgen collection, and in the Rutgers College collection.

P. celsa Hy. Edw.

1881. Hy. Edw., Papilio, I, 101, *Plusia*.

HABITAT.—Oregon.

The type is in the Neumœgen collection.

P. epigæa Grt.*

1874. Grt., Proc. Ac. Nat. Sci., Phil., 1874, 208, *Plusia*.

HABITAT.—New York in July; Massachusetts in July; Colorado.

The type is in the British Museum.

P. surena Grt.

1882. Grt., Bull. Geol. Surv., VI, 585, *Plusia*.

HABITAT.—Orono, Maine.

The type is in Mrs. Fernald's collection.

P. basigera Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 836, *Plusia*.
laticlavia Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 98, *Plusia*.

HABITAT.—New York; New Jersey in October; Florida.

Walker's type is in the British Museum, from "North America." Mr. Morrison's type is in the Tepper collection; the two are identical. I have unfortunately referred Dr. Lintner's *culta* to *laticlavia*, with which it has little in common.

P. ampla Wlk.*

1857. Wlk., C. B. Mus., Het., XII, 910, *Plusia.*

HABITAT.—Hudson Bay Territory; Canada; Northern and Eastern States, July and August.

The type is in the British Museum.

P. simplex Gn.*

1852. Gn., Spec. Gen., Noct., II, 346, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII, 907, *Plusia.*
1877. Grt., Bull. Geol. Surv., III, 119, *Plusia.*
1881. Coquillett, Can, Ent., XIII, 21—larva sub nom. *precationis.*
1882. Coquillett, Can. Ent., XIV, 16, larva.

HABITAT.—Hudson Bay Territory; Canada; United States east of the Rocky Mountains, throughout the season; Colorado, 12,000 feet; New Mexico.

The type is in the British Museum.

P. pasiphæia Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 146, pl. IV, f. 1, *Plusia.*

HABITAT.—California in October.

The type is in the British Museum. Mr. Grote has cited, with a query, *P. echinocystis* Behr, to this species. The description of Dr. Behr's species tells nothing; but I have given under *brassicæ* my reasons for citing it there.

P. diasema Bdv.

1829. Bdv., Eur. Lep., Ind. Meth., 93, *Plusia.*
1852. Gn., Spec. Gen., Noct., II, 355, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII, 902, *Plusia.*
1857. Staud., Stett. Ent. Zeit., 1857, 305, *Plusia.*

HABITAT.—Labrador; Lapland; Colorado.

The type is probably with M. Oberthür, at Rennes. Mr. Grote has always written *diasemia* Dalman; but I have not been able to ascertain why. I still followed Mr. Grote in my list, but make the change here because I can not trace the species otherwise.

P. parilis Hbn.

1800. Hbn., Schmett. Eur., Noct., III, 422, *Noctua.*
1816. Hbn., Verzeichniss, 251, *Autographa.*
1829. Bdv., Ind. Meth., 159, *Plusia.*
1852. Gn., Spec. Gen., Noct., II, 355, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII, 903, *Plusia.*
1860. Moeschl., Wien. Ent. Monatschr., IV, 371, *Plusia.*
quadriplaga Wlk.
1857. Wlk., C. B. Mus., Het., XII, 911, *Plusia.*

HABITAT.—Fraw Island, Arctic North America; Labrador; Lapland.

Walker's type is in the British Museum, and is the *parilis* of the Grote, Mœschler, and other collections. Walker cites Cramer's figure of *Phalæna iota* (Ex. II, 106, pl. 165, fig. *C.*) to his species, suggesting that it did not represent the Linnæan species. *Iota*, by the bye, is recorded as American by Kirby; but probably erroneously. So also *mya* Hbn. is made Canadian by Walker. It is a matter of some interest perhaps to ascertain what these authors had before them; but the names need not be repeated here to cumber the list.

P. sackeni Grt.

1877. Grt., Can. Ent., IX, 135, *Plusia*.
1878. Grt., Bull. Geol. Surv., III, 801, *Plusia*.

HABITAT.—Colorado.

The type is in the British Museum.

P. snowi Hy. Edw.*

1884. Hy. Edw., Papilio, IV, 44, *Plusia*.

HABITAT.—New Mexico; Colorado, South Park.

The type is in Prof. Snow's collection.

P. accurata Hy. Edw.

1882. Hy. Edw., Papilio, II, 127, *Plusia*.

HABITAT.—Washington.

Mr. Neumœgen has the type. It is probably not a *Plusia* at all.

P. alterna Strk.

1885. Strk., Proc. Ac. Nat. Sci. Phil., XXXVII, 178, *Plusia*.

HABITAT.—Colorado.

The type is in the Strecker collection.

P. corrusca Strk.

1885. Strk., Proc. Ac. Nat. Sci. Phil., XXXVII, 178, *Plusia*.

HABITAT.—Colorado.

The type is in the Strecker collection. I do not know this or the preceding species, and the proper placing it is impossible from the description.

P. omicron Linn.

1823. Afzelius, Life of Linnæus, *Phalæna*.
1816. Hbn., Verzeichniss, 251, *Autographa*.
1826. Afzelius, Life of Linnæus, Berlin (trans.), 137, *Phalæna*.
1857. Wlk., C. B. Mus., Het., XII, 906, ? = *verruca*.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 208, ? = *simplex*.

HABITAT.—North America (? New York.)

It is perhaps questionable whether this species can ever be identified with certainty. This, however, is a question for a future monographer of the genus and not for the catalogue maker.

P. indigna Wlk.

1857. Wlk., C. B. Mus., Het., XII, 909, *Plusia*.

HABITAT.—"Georgia."

The type is in the British Museum. It is a small species, not in the

Grote collection, and which I had never before seen. It has a peculiarly elongate, narrow, silver-margined spot, extending to the t. p. line at the sinus. It seems really more southern in type. The specimen is without locality, bought in the Milne collection, and is quite as likely to be Australian as American.

Genus **CALOPLUSIA** Smith.

1884. Smith, Bull. Bkln. Ent. Soc., vii, 68.

C. alticola Wlk.*

1857. Wlk., C. B. Mus., Het., xii. 912, *Plusia.*
1874. Pack., Rept. Geol. Surv., 1874, 554, = *hochenwarthi.*
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., xi, 99, = *hochenwarthi.*
ignea Grt.
1863. Grt., Proc. Ent. Soc. Phil., ii, 274, *Plusia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 31, pr. syn.
1874. Pack., Rept. Geol. Surv., 1874, 554, pr. syn.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., xi, 99, pr. syn.

HABITAT.—Rocky Mountains; Pike's Peak; Colorado.

The type of *alticola* is probably in the British Museum. I have no type mark to the name in my notes, and cannot now remember whether the specimens seen were not from the Grote collection. The type of *ignea* should be in the collection of the American Entomological Society; but I have not been able to find it there.

C. hochenwarthi Hochenw.*

1785. Hochenw., Act. Soc. Berol., vi, 337, pl. 7, f. 2, *Phalæna.*
1786. Esp., Eur. Schmett., iv, pl. 179, f. 3, *Noctua.*
1811. Oliv., Enc. Meth., viii, 314, = *divergens.*
1852. Gn., Spec. Gen., Noct., ii, 356, = *divergens.*
1857. Wlk., C. B. Mus., Het., xii, 904, = *divergens.*
1860. Moeschl., Wien. Ent. Monatschr., iv, 370, *Plusia.*
1874. Pack., Rept. Geol. Surv., 1874, 545, 554, *Plusia.*
1875. Morr., Ann. Lyc. Nat. Hist. N. Y., xi, 99, *Plusia.*
divergens Fabr.
1787. Fabr., Mant. Ins., ii, 162, *Noctua.*
1793. Fabr., Ent. Syst., iii, 2, 80, *Noctua.*
1811. Oliv., Enc. Meth., viii, 314, *Noctua.*
1816. Hbn., Verzeichniss, 250, *Syngrapha.*
1823. Treit., Schmett. Eur., v, 194, *Plusia.*
1852. Gn., Spec. Gen., Noct., ii, 355, *Plusia.*
1857. Wlk., C. B. Mus., Het., xii, 904, *Plusia.*
1871. Staud., Cat. Lep. Eur., 127, pr. syn.
1874. Pack., Rept. Geol. Surv., 1874, 554, pr. syn.

HABITAT.—Labrador; White Mountains; Colorado, South Park, Hall Valley, in August.

I have not given all the European bibliography. It is possible that Hübner's term *Syngrapha* may supersede *Caloplusia*; but I can not now compare the Verzeichniss to ascertain the type of the genus. It differs from *Plusia* in the narrow, ovate eyes, the spinose tibiæ, and anartiform habitus.

C. devergens Hbn.*

1800. Hbn., Schmett. Eur., Noct., 500, 501, *Noctua.*
1816. Hbn., Verzeichniss, 250, *Syngrapha.*
1823. Treit., Schmett. Eur., v, 197, *Plusia.*
1852. Gn., Spec. Gen., Noct., II, 356, *Plusia.*
1857. Wlk., C. B. Mus., Het., XII, 903, *Plusia.*

HABITAT.—Colorado; Labrador.

Genus **LEPIPOLYS** Gn.
1852. Gn., Spec. Gen., Noct., II, 173.

L. perscripta Gn.

1852. Gn., Spec. Gen., Noct., II, 174, pl. vii f. 10, *Lepipolys.*
1857. Wlk., C. B. Mus., Het., XI, 677, *Lepipolys.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 147, *Lepipolys.*

HABITAT.—Massachusetts; Florida; Texas; Colorado; California, in May.

The type is in the British Museum. The species is well marked and easily recognizable.

Genus **CALPE** Tr.
1825. Tr., Schmett. Eur., v, 2, 168.

C. canadensis Beth.*

1865. Bethune, Proc. Ent. Soc. Phil., IV, 213, *Calpe.*
1868. Bethune, Can. Ent., I, 71, *Calpe.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 166, 350, *Calpe.*
1878. Thaxt., Psyche, II, 123, larva.
1880. Coquillett, Can. Ent., XII, 44, larva.
purpurascens Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 842, *Plusiodonta.*
1868. G. & R., Trans. Am. Ent. Soc., II, 87, pr. syn.
1868. Bethune, Can. Ent., I, 71, pr. syn.
sobria Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 846, *Oræsia.*
1868. G. & R., Trans. Am. Ent. Soc., II, 87, per syn.

HABITAT.—Canada; New York, in August and September; New Jersey; Massachusetts in July; New Hampshire in September.

Walker's types are in the British Museum. Dr. Bethune's type is probably in his own collection.

Genus **GONODONTA** Hbn.
1816. Hübner, Verzeichniss, 263.

G. unica Neum.

1891. Neum., Can. Ent., XXIII, 125, *Gonodonta.*

HABITAT.—Indian River, Florida.

Types are in the Neumœgen and Palm collections.

Genus PLUSIODONTA Gn.

1852. Gn., Spec. Gen., Noct., II, 359.

P. compressipalpis Gn.*

1852. Gn., Spec. Gen., Noct., II, 359, pl. 12, f. 2, *Plusiodonta*.
1857. Wlk., C. B. Mus., Het., XII, 938, *Plusiodonta*.
insignis Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 842, ? *Plusiodonta*.

HABITAT.—Canada to Georgia, to Texas; east of the Rocky Mountains, June, July, September.

The types are in the British Museum. It is one of the mysteries how Walker, with Guenée's type and figure before him, could rename so prominent a species.

Genus HYPSOROPHA Hbn.

1816. Hbn., Verzeichniss, 249.

H. monilis Fabr.*

1781. Fabr., Spec. Ins., II, 219, *Noctua*.
1787. Fabr., Mant. Ins., II, 147, *Noctua*.
1793. Fabr., Ent. Syst., III, 2, 46, *Noctua*.
1811. Oliv., Encycl. Meth., VIII, 281, *Noctua*.
1816. Hbn., Verzeichniss, 249, *Hypsoropha*.
1818. Hbn., Zutraege, f. 23 and 24, *Hypsoropha*.
1857. Wlk., C. B. Mus., Het., XIII, 994, *Hypsoropha*.
1880. Grt., Can. Ent., XII, 85, *Hypsoropha*.

HABITAT.—Southern States; west to Kansas. Missouri in June.

H. hormos Hbn.

1818. Hbn., Zutraege, 10, ff. 27, 28, *Hypsoropha*.
1816. Hbn., Verzeichniss, 249, *Hypsoropha horma*.
1852. Gn., Spec. Gen., Noct., II, 403, *Monogona*.
1857. Wlk., C. B. Mus., Het., XIII, 995, *Tiauspa*.
1880. Grt., Can. Ent. XII, 85, *Hypsoropha*.

HABITAT.—New York to Texas; Central States. District of Columbia in August.

Genus HEMICERAS Gn.

1852. Gn., Spec. Gen., Noct., II, 379.

H. cadmia Gn.

1852. Gn., Spec. Gen., Noct., II, 383, pl. 13 f. 2, *Hemiceras*.
1857. Wlk., C. B. Mus., Het., XIII, 970, *Hemiceras*.
obliquilinea Wlk.
1862. Wlk., C. B. Mus., Het., XXVI, 1695, *Comidava*.

HABITAT.—Middle and Southern States.

Walker's type is in the British Museum, while that of M. Guenée is at Rennes with M. Oberthür. Walker's species was described as a geometrid, from Venezuela.

Genus **CIRRHOPHANUS** Grt.

1872. Grt., Can. Ent., IV, 187.

C. triangulifer Grt.*

1872. Grt., Can. Ent., IV, 187, *Cirrhophanus.*
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 421, fig., *Cirrhophanus.*
1882. Grt., Ill. Essay, 60, pl. 3 f. 26, *Chariclea.*
1882. Grt., Can. Ent., XIV, 183, *Cirrhophanus.*
1883. Riley, Amer. Naturalist, XVII, 788, fig., *Cirrhophanus.*
1883. Grt., Can. Ent., XV, 76, *Cirrhophanus.*
pretiosa Morr.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 122, *Chariclea.*
1875. Grt., Check List Noctuidæ, 12, pr. syn.
1882. Grt., Ill. Essay, 60, pr. syn.

HABITAT.—Middle and Central States to Kansas.

The original type specimen is in the National Museum from the Riley collection. Mr. Morrison's type I have not seen.

C. duplicatus Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 112, *Cirrhophanus.*

HABITAT.—Platte Cañon, Colorado, 6,500 feet.

The type is in the National Museum.

Genus **BASILODES** Gn.

1852. Gn., Spec. Gen., Noct., II, 358.

B. pepita Gn.*

1852. Gn., Spec. Gen., Noct., II, 358, pl. 12 f. 1, *Basilodes.*
1857. Wlk., C. B. Mus., Het., XII, 936, *Basilodes.*
1883. Grt., Can. Ent., XV, 73, *Basilodes.*

HABITAT.—Virginia to Florida, to Colorado.

The type is with M. Oberthür at Rennes.

B. chrysopis Grt.*

1881. Grt., Papilio, I, 154, *Basilodes.*

HABITAT.—Arizona; Colorado; New Mexico.

The type is with Mr. Neumœgen.

B. territans Hy. Edw.*

1884. Hy. Edw., Papilio, IV, 45, *Basilodes.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

B. howardi Hy. Edw.*

1877. Hy. Edw., Pacific Coast, Lep., 25, p. 1, *Plusia.*
1884. Hy. Edw., Papilio, IV, 45, *Basilodes.*

HABITAT.—Arizona.

The type is in the Edwards collection.

B. mirabilis Neum.

1884. Neum., Papilio, IV, 94, *Basilodes.*

HABITAT.—Southwestern Arizona.
The type is in the Neumœgen collection.

Genus STIRIA Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 73.

S. rugifrons Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 73, *Stiria.*
1882. Grt., Can. Ent., XIV, 76, *Stiria.*
1883. Grt. Can. Ent., XV, 74, *Stiria.*

HABITAT.—Kansas; Colorado, Denver in June.
The type is in the British Museum.

S. sulphurea Neum.

1882. Neum., Papilio, II, 135, *Stiria.*

HABITAT.—Arizona.
The type is in Mr. Neumœgen's collection.

S. nanata Neum.

1884. Neum., Papilio, IV, 95, *Stiria.*

HABITAT.—New Mexico.
The type is with Mr. Neumœgen.

Genus STIBADIUM Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 74.

S. spumosum Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 74, *Stibadium.*
1882. Grt., Can. Ent., XIV, 76, *Stibadium.*
1883. Grt., Can. Ent., XV, 74, *Stibadium.*

HABITAT.—New York to Kansas; Illinois; Colorado in August; Nebraska in August.
The type is in the British Museum.

S. aureolum Hy. Edw.*

1882. Hy. Edw., Papilio, II, 126, *Stibadium.*

HABITAT.—Arizona.
The types are in the Neumœgen and Edwards collections.

S. curiosum Neum.

1883. Neum., Papilio, III, 141, *Stibadium.*

HABITAT.—Arizona.
Types are in the Neumœgen collection.

S. navium Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 10, *Telesilla navia.*
1883. Grt., Can. Ent., XV, 131, *Telesilla.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 111, *Stibadium.*

HABITAT.—Texas in May.

The type is in the British Museum, and is like the specimens I have seen so named. The type shows, distinctly enough, all the structural characters of the present genus, and only the superficial habitus of *Telesilla.*

Genus PLAGIOMIMICUS Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 182.

The relation of the three preceding to the present genus can not be considered as settled. In the Bull. Bkln. Ent. Soc., V, 30, I had united them all as *Basilodes*, which is perhaps too radical a procedure. As new species have been and will be added, the relations will become more clear. Some of the species of *Plusia* will find a place here I think, and perhaps some other species elsewhere referred at present.

P. pitychromus Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 182, *Plagiomimicus.*
1882. Grt., Can. Ent., XIV, 75, 182, *Plagiomimicus.*
1882. Grt., Papilio, II, 183, *Plagiomimicus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 172, *Plagiomimicus.*
media Morr.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 123, *Schinia.*
1880. Grt., Can. Ent., XII, 185, pr. syn.

HABITAT.—New York in August; Middle, Southern, and Central States; Colorado; Nebraska; Texas in August.

Grote's type is in the British Museum. Mr. Morrison's specimen I have not seen.

P. triplagiatus Smith.*

1890. Smith, Ento. Amer., VI, 139, *Plagiomimicus.*

HABITAT.—Las Vegas, New Mexico, 7,000 feet, August.

Types are in the Neumœgen collection and in the Rutgers College (Hulst) collection.

P. tepperi Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 68, *Schinia.*
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 124, *Polenta.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Plagiomimicus.*
1882. Grt., Can. Ent., XIV, 75, *Plagiomimicus.*
1882. Grt., Papilio, II, 185, *Plagiomimicus.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 172, *Plagiomimicus.*
richi Grt.
1886. Grt., Can. Ent., XVIII, 99, *Plagiomimicus.*
1891. Smith, List Lepidoptera, 53, pr. syn.

HABITAT.—Texas, in March; Colorado in August.

Mr. Morrison's types are in the Tepper and Neumœgen collections; Mr. Grote's is in the British Museum. I am, at least in great part, responsible for Mr. Grote's synonym, by insisting, correctly enough, that Mr. Morrison's type in the Tepper collection had unarmed fore tibiæ as described. Many specimens examined since, prove that this was a defect in the type and not characteristic of the species.

P. expallidus Grt.*

1882. Grt., Papilio, II, 185, *Plagiomimicus.*

HABITAT.—Montana; Colorado, Platte Cañon in August.

Types are in the National Museum and in the Neumœgen collection.

P. viridifera Grt.

1882. Grt., Can. Ent., XIV, 217, *Zotheca.*
1891. Smith, List Lepidoptera, 53, *Plagiomimicus.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection. The species has a curious color resemblance to the species of *Zotheca;* but in head and feet structures the reference here is justified.

Genus FALA Grt.

1875. Grt. Proc. Ac. Nat. Sci. Phil., 1875, 425.

F. ptycophora Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 426, *Fala.*
1882. Grt., Ill. Essay, 64, pl. 3, f. 36, *Fala.*
1883. Grt., Can. Ent., XV, 74, *Fala.*

HABITAT.—California.

The type is in the British Museum. It is a curious mottled species, with heavy body and primaries, in which the costa is depressed and the apices are distinct. A specimen in the National Museum had long puzzled me as to its location, as I could not make it function satisfactorily with Mr. Grote's descriptions.

Genus ACOPA Harv.

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 279.

A. carina Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 279, *Acopa.*
1878. Grt., Can. Ent., X, 67, *Acopa.*
1883. Grt., Can. Ent., XV, 77, *Acopa.*

HABITAT.—Texas, in October.

The type is in the British Museum.

A. perpallida Grt.

1878. Grt., Can. Ent., X, 68, *Acopa.*

HABITAT.—Kansas.

The type is in the British Museum.

A. incana Hy. Edw.

1882. Hy. Edw., Papilio, II, 128, *Acopa.*

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

A. pacifica Hy. Edw.

1884. Hy. Edw., Papilio, IV, 46, *Acopa.*

HABITAT.—Arizona.

The type is said to be in the Neumœgen collection.

Genus NEUMŒGENIA Grt.
1882. Grt., Papilio, II, 132.

N. poetica Grt.

1882. Grt., Papilio, II, 132, 184, *Neumœgenia.*

HABITAT.—Arizona; Oregon.

The type is in the Neumœgen collection.

Genus ANTAPLAGA Grt.
1877. Grt., Can. Ent., IX, 71.

A. dimidiata Grt.*

1877. Grt., Can. Ent., IX, 71, *Antaplaga.*
1882. Grt., Can. Ent., XIV, 74, *Antaplaga.*
1882. Smith, Trans. Am. Ent. Soc., X, 217, *Antaplaga*

HABITAT.—Colorado.

The type is in the British Museum.

With this genus begins that series treated by me ten years ago in vol. x, of the Transactions of the American Entomological Society under the title, "Synopsis of the North American Heliothinæ." This was my first monographic paper, and somewhat crude. It has proved itself accurate enough as to facts, but somewhat too radical in some of its conclusions. Larger material has modified my views as to the standing of some species, and I have made some changes of sequence. As a whole, however, I have retained the results of that work, adding largely to the bibliography.

A. sexseriata Grt.

1881. Grt., Papilio, I, 176, *Grotella.*
1882. Grt., Ill. Essay, 61, pl. 3, f. 29, *Grotella.*
1882. Smith, Trans. Am. Ent. Soc., X, 217, *Antaplaga.*

HABITAT.—Arizona.

The types are in the British Museum and in the Neumœgen collection.

A. biundulata Zell.

1872. Zell., Verh. k. k. zoöl. bot. Ges., 1872, 502, pl. III, f. 14, *Sedenia biundulalis.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 120, *Antaplaga.*

HABITAT.—Texas.

There are specimens of this species, probably named by Zeller himself, in the Berliner Museum, agreeing with the specimens upon which my note was based. Like it, they came from Boll, Texas, and were placed among the Noctuidæ.

A. composita Hy. Edw.

1884. Hy. Edw., Papilio, IV, 44, *Eulithosia.*
1891. Smith, List Lepidoptera, 53, *Antaplaga.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

A. thoracica Hy. Edw.

1884. Hy. Edw., Papilio, IV, 44, *Eulithosia.*
1891. Smith, List Lepidoptera, 53. *Antaplaga.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen. The two last-named species were made types of a new Lithosiid genus by Mr. Edwards, who allowed a certain false habitus to deceive him. The frontal and tibial structure is characteristic of the present genus.

Genus **GROTELLA** Harv.
1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 278.

G. septempunctata Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 278, *Grotella.*
1882. Smith, Trans. Am. Ent. Soc., X, 218, *Grotella.*

HABITAT.—Texas, in August and October; Colorado.

The type is in the British Museum.

G. dis Grt.*

1883. Grt., Ann. and Mag. N. H., 1883, 55, *Grotella.*
1883. Grt., Trans. Kans. Ac. Sci., VIII, 55, *Grotella.*

HABITAT.—New Mexico; Arizona.

The types are with Mr. Neumœgen and in the National Museum.

Genus **PIPPONA** Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 9.

P. bimatris Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 10, *Pippona.*
1882. Grt., Can. Ent., XIV, 75, *Pippona.*
1882. Smith, Trans. Am. Ent. Soc., X, 216, *Pippona.*

HABITAT.—Texas, in October.

The type is in the British Museum.

Genus **BESSULA** Grt.
1881. Grt., Papilio, I, 176.

B. luxa Grt.

1881. Grt., Papilio, I, 176, *Bessula.*
1882. Grt., Can. Ent., XIV, 74, *Bessula.*
1882. Smith, Trans. Am. Ent. Soc., X, 218, *Bessula.*

HABITAT.—New Mexico; Colorado.

The type is in the British Museum. It is an easily recognized form, much like *Pippona* in outline, which I had not before seen.

Genus **OXYCNEMIS** Grt.

1882. Grt., Can. Ent. XIV, 182.

O. advena Grt.

1882. Grt., Can. Ent., XIV, 182, *Oxycnemis*.
1882. Grt., Proc. Am. Phil. Soc., XXI, 165, 175. *Oxycnemis*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **NYCTEROPHÆTA** Smith.

1882. Smith, Bull. Bkln. Ent. Soc., IV, 45.

N. luna Morr.*

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 122, *Cucullia*.
1891. Smith, List Lepidoptera, 53, *Nycterophæta*.
magdalena Hulst.
1882. Hulst, Bull. Bkln. Ent. Soc., IV, 45, *Nycterophæta*.
1891. Smith, List Lepidoptera, 53, pr. syn.
notatella Grt.
1882. Grt., Can. Ent., XIV, 75, *Epinyctis*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 161, = *magdalena*.

HABITAT.—Dakota; Wyoming; Black Hills; Montana; Colorado, Denver in June.

Mr. Morrison's type is, I believe, in the Strecker collection. Mr. Hulst's is in the Rutgers College collection, while Mr. Grote described from the Neumœgen collection.

Genus **COPABLEPHARON** Harv.

1878. Harv., Can. Ent., X, 56.

C. absidum Harv.*

1874. Harv., Bull. Buff. Soc. Nat. Sci., II, 275, *Ablepharon*.
1876. Harv., Can. Ent., VIII, 35, *Arsilonche*.
1878. Harv., Can. Ent., X, 56, *Copablepharon*.
grandis Strk.
1875. Strk., Lep. Rhop. et Het., 129, *Aedophron*.
1879. Grt., Can. Ent., XI, 29, pr. syn.

HABITAT.—California in July; Oregon; Colorado; Montana.

Dr. Harvey's type is in the Edwards collection. That of *grandis* is probably in the Strecker collection.

C. subflavidens Grt.*

1882. Grt., Can. Ent., XIV, 169, *Copablepharon*.

HABITAT.—Montana.

The type is with Mr. Neumœgen.

C. longipenne Grt.

1882. Grt., Can. Ent. XIV, 169, *Copablepharon*.

HABITAT.—Montana.

The type is with Mr. Neumœgen.

C. album Harv.*

1876. Harv., Can. Ent., VIII, 35, *Arsilonche.*
1882. Grt., Can. Ent., XIV, 169, *Copablepharon.*

HABITAT.—Oregon; Colorado; Montana.

The type is in the Edwards collection.

Genus AEDOPHRON Led.

1857. Lederer, Noct. Europ., 180.

A. pallens Tepper.

1882. Tepper, Trans. Am. Ent. Soc., X, 215, *Aedophron.*

HABITAT.—Southern California.

The type is in the Tepper collection.

Genus THYREION Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 121.

T. snowi Grt.

1875. Grt., Proc. Ac. Nat. Sci., Phil., 1875, 422, *Aedophron.*
1876. Grt., Stett. Ent. Zeit., XXXVII, 137, *Aedophron.*
1882. Grt., Ill. Essay, 65, pl. III, f. 37, *Aedophron.*
1882. Smith, Trans. Am. Ent. Soc., X, 216, ? *Aedophron.*
1891. Smith, Trans. Am. Ent. Soc., XVIII, 121, *Thyreion.*

HABITAT.—Kansas.

A specimen (? the type) is in the British Museum and agrees generically with the following species:

T. rosea Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 121, *Thyreion.*

HABITAT.—South Park, Colorado.

The type is with Mr. Neumœgen.

Genus CHLORIDEA Westw.

1841. Westw., in Jardine, N. H. Libr., XXXVII, 198.

I use this generic term instead of uniting the two species with *Heliothis*, because, though very closely allied, they can be separated and an overloading of the genus prevented. The only apparent difference is in the wing form, their proportion to the body, and in the pattern of maculation.

C. virescens Fabr.*

1781. Fabr., Spec. Ins., II, 217, *Noctua.*
1787. Fabr., Mant. Ins., II, 141, *Noctua.*
1793. Fabr., Ent. Syst., III, 2, 30, *Noctua*—larva.
1811. Oliv., Enc. Meth., VIII, 269, *Noctua.*
1841. Westw., in Jardine N. H. Libr., 37, 199, pl. 24, f. 3, *Chloridea.*
1852. Gn., Spec. Gen., Noct., II, 175, *Aspila.*
1857. Wlk., C. B. Mus., Het., XI, 678, *Chloridea.*
1868. H. Sch., Corr. Blatt, Cuba, p. 10, *Chloridea.*
1880. Riley, Am. Ent., III, 7, larva.

1885. Gundlach, Cont. Ent. Cub., 310, *Aspila.*
1885. Riley, 4th Rept. Ent. Comm., 351, pl. LXII, 4, *Aspila.*
rhexia S. & A.
1792. S. & A., Ins. Ga., II, 199, pl. 100, *Phalæna.*
1852. Gn., Spec. Gen., Noct., II, 175, *Aspila.*
1857. Wlk., C. B. Mus., Het., XI, 696, *Chloridea.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 33, *Chloridea.*
1882. Smith, Trans. Am. Ent. Soc., X, 220, *Chloridea.*
1885. Gundlach, Cont. Ent. Cub., 310, pr. syn.
1885. Riley, 4th Rept. Ent. Comm., 351, pr. syn.
spectanda Strk.
1875. Strk., Lep. Rhop. et Het., 122, *Heliothis.*
1879. Grt., Can. Ent., XI, 29, pr. syn.

HABITAT.—Canada in October; Middle, Southern, and Central States west to Colorado; Kansas in August; California in September and October.

Gundlach makes it *rhexia* ♂, *virescens* ♀, while Riley unites the two on the study of long series of material. I have no doubt they are correct, though Guenée points out what seem to him good characters and gives the Fabrician species a South American habitat only.

C. subflexa Gn.

1852. Gn., Spec. Gen., Noct., II, 175, *Aspila.*
1857. Wlk., C. B. Mus., Het., XI, 678, *Chloridea.*
1882. Smith, Trans. Am. Ent. Soc., X, 250, *Aspila.*

HABITAT.—North America.

The type is probably with M. Oberthür at Rennes. I am not aware that the species has been identified in American collections and I have seen nothing quite agreeing with the description.

Genus HELIOCHEILUS Grt.

1865. Grt., Proc. Ent. Soc. Phil., IV, 328.

H. paradoxus Grt.*

1865. Grt., Proc. Ent. Soc. Phil., IV, 329, pl. III, f. 4 and 6, *Heliocheilus.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 123, *Heliocheilus.*
1882. Smith, Trans. Am. Ent. Soc., X, 220, *Heliothis.*

HABITAT.—Southern and Central States; Texas, in March; Colorado.

I have not seen the type, which should be in the Philadelphia collection.

H. albidentina Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 680, *Perigea.*
1890. Butler, Entomologist, XXIV, 265,=*Anthœcia inflata.*

HABITAT.—Florida.

The type is in the British Museum. Compared with *paradoxus*, it is darker throughout, the markings more obvious, s. t. space blackish, with the t. p. line white, denticulate in one specimen only. Anterior tibia with one inner and one outer spine or claw. A curious form, apparently distinct from the South American species. The foregoing is my note on the species. Since then I have received Mr. Butler's notes in which he makes the species equal *A. inflata* Wallengren, Wien. Ent. Monatschr., 1860, IV, 172, from Honolulu, and suggests that *paradoxus* may be only a paler form. Mr. Butler may be right in his reference, but the species seemed to me distinct, though near allies. Under the circumstances I prefer to hold both species as above, for the present.

Genus **HELIOTHIS** Ochs.

1816. Ochs., Schmett. Eur., IV, 91.

H. armiger Hbn.*

1810. Hbn., Samml. Eur. Schmett., Noct., 370, *Noctua.*
1816. Ochs., Schmett. Eur., IV, 91, *Heliothis.*
1852. Gn., Spec. Gen., Noct., II, 181, *Heliothis.*
1857. Wlk., C. B. Mus., Het., XI, 684, *Heliothis.*
1868. H. Sch., Corr. Blatt, 1868, Cuba, p. 10, *Heliothis.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 158, *Heliothis.*
1882. Smith, Trans. Am. Ent. Soc., X, 220, *Heliothis.*
1885. Riley, 4th Rept. Ent. Comm., 355–384, pl. III and IV, *Heliothis.*
    umbrosus Grt.
1863. Grt., Proc. Ent. Soc. Phil., I, 219, *Heliothis.*
1863. Grt., Proc. Ent. Soc. Phil., I, 347, pr. syn.

HABITAT.—Canada; United States generally, throughout the season.

The bibliography given is scant, because in the fourth Report of the U. S. Ent. Comm., there is a very complete list of the literature to 1883. Since that time the species has been again and again treated in economic publications, in most cases without adding anything that is new. The Annual Reports of the United States Department of Agriculture since 1885 should be consulted. For the purposes of this catalogue no more references are needed.

H. phlogophagus G. and R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 180, *Heliothis.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 121, *Heliothis.*
1881. Coquillett, Papilio I, 56, larva.
1882. Smith, Trans. Am. Ent. Soc., X, 221, = *dipsaceous.*
1891. Butler, Entomologist, XXIV, 262, ? an sp. dist. *dipsaceous.*
    var. **interjacens** Grt.
1880. Grt., Bull. Bkln. Ent. Soc., III, 30, *Heliothis.*
1881. Grt., Papilio, I, 158, pr. syn.
    var. **luteitinctus** Grt.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 426, *Heliothis.*
1882. Smith, Trans. Am. Ent. Soc., X, 221, = *maritima.*

HABITAT.—Central, Western, and Southern States; Texas in April; Nebraska; Colorado, August to October; New Mexico; British Columbia; Utah; California, in June.

Mr. Grote's types are in the British Museum, where a good series of specimens enabled me to make careful comparisons with the European *dipsaceous* and its varieties. Quite unexpectedly I found that the American form, though a "representative" one, was quite distinct from the European, and that Mr. Grote's names must be restored.

H. **scutosus** Fabr.

1787. Fabr., Mant. Insect., ii, 142, *Noctua.*
1793. Fabr., Ent. Syst., iii, 2, 23, *Noctua.*
1811. Oliv., Enc. Meth., viii, 271, *Noctua.*
1825. Treits., Schmett. Eur., v, 224, *Heliothis.*
1852. Gn., Spec. Gen., Noct., ii, 182, *Heliothis.*
1857. Wlk., C. B. Mus., Het., xi, 681, *Heliothis.*
1882. Smith, Trans. Am. Ent. Soc., x, 222, *Heliothis.*
nuchalis Grt.
1878. Grt., Can. Ent., x, 68, *Heliothis.*
1878. Grt., Can. Ent., x, 232, *Heliothis.*
1882. Smith, Trans. Am. Ent. Soc., x, 222, pr. syn.

HABITAT.—Kansas; Colorado; Montana, in May.

Mr. Grote's type is in the British Museum. After careful comparison I have no doubt of its identity with the European species.

H. **suavis** Hy. Edw. *

1884. Hy. Edw., Papilio, iv, 45, *Heliothis.*

HABITAT.—New Mexico; Colorado, South Park.

The type is with Prof. Snow.

Genus **DERRIMA** Wlk.
1857. Wlk., C. B. Mus., Het., xii, 770.

D. **henrietta** Grt. *

1864. Grt., Proc. Ent. Soc. Phil., iii, 3, pl. ii, f. 1, *Philomma.*
1868. Grt., Trans. Am. Ent. Soc., ii, 119, *Derrima.*
1882. Smith, Trans. Am. Ent. Soc., x, 236, *Derrima.*
1883. Grt., Proc. Am. Phil. Soc., xxi, 165, =*stellata.*
ab. **stellata** Wlk.
1857. Wlk., C. B. Mus., Het., xii, 770, *Derrima.*
1868. Grt., Trans. Am. Ent. Soc., ii, 119, *Derrima.*
1882. Smith, Trans. Am. Ent. Soc., x, 236, ? pr. syn.

HABITAT.—Massachusetts; New York southward; west to the Mississippi States.

Mr. Grote's type I have not seen; but there can be no question as to his species. Specimens of it labeled by Mr. Grote are in the British Museum, where also Walker's type is. The latter is only a somewhat suffused aberration of the normal form and should be cited as such. The white lunules between disk and outer band of primaries are more marked than usual and the secondaries have a rosy flush, else there is no difference that is apparent to me.

Genus **CHAMACLEA** Grt.
1883. Grt., Can. Ent., xv, 76.

C. **pernana** Grt.

1881. Grt., Papilio, i, 155, *Chariclea.*
1882. Grt., Can. Ent., xiv, 183, *Chariclea.*
1882. Grt., Ill. Essay, 60, pl. 3, f. 27, *Chariclea.*

A type is in the National Museum from my collection. Mr. Grote gave it me years ago. Other specimens, also marked "type," are in Mr. Neumœgen's collection.

Genus **RHODODIPSA** Grt.
1877. Grt., Bull. Geol. Surv., III, 797.

R. volupia Fitch.*

1858. Fitch, 12th Rept., Trans. N. Y. State Agl. Soc., for 1857, 900-908, *Alaria.*
1877. Grt., Bull. Geol. Surv., III, 797, *Rhododipsa.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 47, *Rhododipsa.*
1882. Grt., Ill. Essay, 62, pl. III, f. 33, *Rhododipsa.*
1882. Smith, Trans. Am. Ent. Soc., X, 250, *Alaria.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 174, *Rhododipsa.*

HABITAT.—Colorado; Texas.

Fitch's type I saw in 1882, with Dr. A. E. Foote, in Philadelphia. It was in very poor condition, yet recognizable. What has become of it since and whether or not it still has an existence, I do not know. The species is, however, well known and correctly named in collections.

R. miniana Grt.

1881. Grt., Papilio, I, 175, *Rhododipsa.*
1882. Grt., Papilio, II, 64, pl. I, ff. 1 and 2, *Rhododipsa.*
1882. Smith, Trans. Am. Ent. Soc., X, 251, *Rhododipsa.*

HABITAT.—New Mexico.

The type is with Prof. Snow, at Lawrence, Kansas.

Genus **TRIOCNEMIS** Grt.
1881. Grt., Papilio, I, 77.

T. saporis Grt.*

1881. Grt., Papilio, I, 77, *Triocnemis.*

HABITAT.—Colorado; Washington; California.

Types are in the Edwards and Neumœgen collections.

Genus **PSEUDACONTIA** Smith.
1882. Smith, Trans. Am. Ent. Soc., X, 246.

P. crustaria Morr.

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 70, *Acontia.*
1882. Smith, Trans. Am. Ent. Soc., X, 247, *Pseudacontia.*

HABITAT.—Nebraska; Colorado.

The types are in the Tepper collection. The specimen so labeled in the British Museum is unspread and, I think, erroneously determined.

Genus **HELIODORA** Neum.
1891. Neum., Can. Ent., XXIII, 125.

H. magnifica Neum.

1891. Neum., Can. Ent., XXIII, 125, *Heliodora.*

HABITAT.—Houston, Texas.

The type is with Mr. Neumœgen.

Genus SCHINIA Hbn.

1816. Hbn., Verzeichniss, 281.

I use this term here in the same broad sense in which I used it in my Revision of the Heliothinæ, Trans. Am. Ent. Soc., x, 225. It is quite likely that the large number of additional species constantly turning up may require its subdivision and the use of some of the generic terms discarded by me. The line of division may perhaps be that indicated in the Revision; but a better may be found on renewed study. The genera included under the above term are:

Tamila, Gn., Spec. Gen., Noct., II, 176.
Anthœcia, Bdv., Ind. Meth., 162.
Lygranthœcia, G. and R., Trans. Am. Ent. Soc., IV, 432.
Euleucyptera, Grt., Proc. Ent. Soc. Phil., IV, 329.
Tricopis, Grt., Bull. Buff. Soc. Nat., Sci., II, 76.
Oria, Hbn., Verzeichniss, 238.
Porrima, Grt., Bull. Geol. Surv., III, 798.

Besides these, Mr. Grote has, on the characters pointed out by me, used the terms *Trichosellus* and *Canidia* in his Revised Check List of 1891. Some of these names may come into use later; but of these *Lygranthœcia* has perhaps the weakest of all claims to consideration. Of the species treated in the above revision, the tibial armature and wing maculation are there figured; but no reference to these figures is here made.

S. chrysellus Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 76, *Tricopis*.
1883. Smith, Trans. Am. Ent. Soc., x, 227, *Schinia*.

HABITAT.—Texas, March, May to October; Colorado; New Mexico.

The type is in the British Museum.

S. velaris Grt.*

1879. Grt., Can. Ent., XI, 197, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 229, *Schinia*.
ochreifascia Smith.
1883. Smith, Trans. Am. Ent. Soc., XVIII, 126, *Schinia*.

HABITAT.—California, July and August.

Mr. Grote's type is in the British Museum; my types are in the National Museum. I was quite surprised to find Mr. Grote's type the same as my species. It means that the specimens I have seen so named in American collections are erroneously determined and that my description and figures in the Revision apply to some other, perhaps undescribed, species. I can not remember from what collection I had my specimens of *velaris*.

S. hulstia Tepper.

1883. Tepper, Trans. Am. Ent. Soc., x, 228, *Schinia*.

HABITAT.—Texas; Colorado.

The type is in the Tepper collection.

S. aleucis Harv.*

1875. Harv., Can. Ent., VII, 117, *Tricopis*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 10, pl. II, f. 5, *Tricopis*.
1883. Smith, Trans. Am. Ent. Soc., x, 228, *Schinia*.

HABITAT.—Texas in May and October.

The type is in the British Museum.

S. cumatilis Grt.*

1865. Grt., Proc. Ent. Soc. Phil., IV, 330, pl. II, f. 6, *Euleucyptera*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Euleucyptera*.
1877. Grt., Bull. Geol. Surv., III, 798, *Euleucyptera*.
1879. Grt., Can. Ent., XI, 207, *Euleucyptera*.
1883. Smith, Trans. Am. Ent. Soc., x, 228, *Schinia*.
sulmula Strk.
1879. Strk., Rept. Chief Eng., 1878–79, p. 1862, pl. II, f. 5. *Heliothis*.
1879. Grt., Can. Ent., XI, 207, pr. syn.

HABITAT.—Colorado, Platte Cañon in August; New Mexico.

Mr. Grote's type is in the collection of the American Entomological Society. Mr. Strecker has his own type.

S. tenuescens Grt.

1883. Grt., Can. Ent., XV, 128, *Lygranthœcia*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

S. biundulata Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 129, *Schinia*.

HABITAT.—Central Colorado.

The type is in Mr. Neumœgen's collection.

S. sexplagiata Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 124, *Schinia*.

HABITAT.—Foothills near Denver, Colorado.

The type is in the National Museum.

S. trifascia Hbn. *

1818. Hbn., Zutrage, I, 17, ff. 33, 34, *Schinia*.
1874. Grt., Proc. Bost. Soc. N. H., XVII, 242, *Schinia*.
1880. Grt., Can. Ent., XII, 84, *Schinia*.
1883. Smith, Trans. Am. Ent. Soc., x, 228, *Schinia*.
lineata Wlk.
1857. Wlk., C. B. Mus., Het., XII, 830, *Anthophila*.
1891. Butler, Entomologist, XXIV, 292, pr. syn.

HABITAT.—United States east of the Rocky Mountains; Denver, Colorado.

I did not see Walker's type and give the above synonymy on Mr. Butler's authority. The name was not on my list and I overlooked the specimen.

S. gracilenta Hbn.

1818. Hbn., Zuträge, I, 8, ff. 5, 6, *Schinia.*
1816. Hbn., Verzeichniss, 282, *Schinia.*
1880. Grt., Can. Ent., XII, 84, *Schinia.*
1883. Smith, Trans. Am. Ent. Soc., X, 228, *Schinia.*
oleagina Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 67, *Schinia.*
1875. Grt., Can. Ent., VII, 222, pr. syn.
imperspicua Strk.
1876. Strk., Lep. Rhop. et Het., 122, *Heliothis.*
1879. Grt., Can. Ent., XI, 29, pr. syn.

HABITAT.—Southern States; Texas.

Mr. Morrison's type was described from the Graef collection as a variety of *gracilenta* and Mr. Grote made it a synonym. Mr. Strecker's type is in his own collection.

S. simplex Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 129, *Schinia.*

HABITAT.—Colorado, foothills, July.

The types are in the National Museum.

S. arefacta Hy. Edw.

1884. Hy. Edw., Papilio, IV, 123. *Tamila.*

HABITAT.—Florida.

The type is in the Neumœgen collection.

S. unimacula Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 126, *Schinia.*

HABITAT.—Colorado.

Types are in Mr. Neumœgen's collection and in the National Museum.

S. obliqua Smith.*

1882. Smith, Trans. Am. Ent. Soc., X, 229, *Schinia.*

HABITAT.—Arizona.

Types are in the National Museum and in the Neumœgen collection.

S. bifascia Hbn.

1818 Hbn., Zutræge, I, 14, ff. 55, 56, *Schinia.*
1816. Hbn., Verzeichniss, 281, *Schinia.*,
1880. Grt., Can. Ent., XII, 85, *Schinia.*
1883. Smith, Trans. Am. Ent. Soc., X, 229, *Schinia.*

HABITAT.—Georgia; Arizona; Colorado.

S. nundina Dru.*

1770. Drury, Illustr., I, 36, pl. 18, f. 5, *Noctua.*
1837. Drury, Illustr., ed. Westw., I, 34, pl. 18, f. 5, *Acontia.*
1852. Gn., Spec. Gen., Noct., II, 176, *Tamila.*
1857. Wlk., C. B. Mus., Het., XII, 697, *Tamila.*

1864. Grt., Proc. Ent. Soc. Phil., III, 4, *Tamila*.
1873. Grt. Bull. Buff. Soc. Nat. Sci., I, 121, *Heliothis*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 229, *Schinia*.
nigrirena Haw.
1810. Haw., Lep., Britt., 266, *Noctua*.
1829. Steph., Ill. Br. Ent., Haust., III, 114.
1852. Gn., Spec. Gen., Noct., II, 176, pr. syn.

HABITAT.—Middle, Southern, and Central States; New Jersey in July.

S. parmeliana Hy. Edw.

1882. Hy. Edw., Papilio, II, 14, *Lyranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 248, *Lygranthœcia*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, *Lygranthœcia*.

HABITAT.—Maryland.

The unique type is in Mr. Schoenborn's collection. It has a remarkable resemblance to *nundina*, with a totally different ground color.

S. acutilinea Grt.*

1878. Grt., Can. Ent., x, 232, *Lygranthœcia*.
1882. Grt., Ill. Essay, 63, pl. III, f. 34, *Lygranthœcia*.
1883. Smith, Trans. Am., Ent. Soc., x, 229, = *separata*.
separata Grt.
1879. Grt., Can. Ent., XI, 198, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 229, *Schinia*.

HABITAT.—Colorado, Glenwood Springs in August; Nevada; Montana; Utah.

Both the types are in the British Museum. After renewed examination and a comparison of other material, I still consider them identical. *Acutilinia* is darker and has the margins of the lines more emphasized; but this fades gradually into the *separata* form. I was in error in using this latter name for the species, since *acutilinea* was earlier described. I was also in error in making *balba* and *walsinghami* synonymous with this species.

S. balba Grt.

1881. Grt., Papilio, I, 156, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 229, = *separata*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen; other specimens in the British Museum.

S. coercita Grt.

1881. Grt., Papilio, I, 156, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 248, *Lygranthœcia*.

HABITAT.—Arizona.

The type is said to be with Mr. Neumœgen; other specimens are in the British Museum. Comparing *coercita* and *balba*, they are closely allied, the former having a wider median space and both ordinary spots evident, while the latter has the reniform only, marked. The species of *Schinia* are much more numerous and closely allied than I suspected in 1882, and the two preceding are fairly marked and both distinct from *separata*, as species go here.

S. walsinghami Hy. Edw.

1881. Hy. Edw., Papilio, I, 20, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x. 229, *Schinia separata*.

HABITAT.—Oregon.

A type specimen is in the Edwards collection, while a very fine series is in the British Museum. A study of the latter shows that the species is perfectly distinct from *separata* and that my reference in 1882 was hasty and based on insufficient material. The specimen in Mr. Edwards's collection really gives no adequate idea of the species.

S. brucei Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 125, *Schinia*.

HABITAT.—Colorado, South Park, and Denver.

Types are in the National Museum and in the Rutgers College collection.

S. lynx Gn.*

1852. Gn., Spec. Gen., Noct., II, 185, *Anthœcia*.
1857. Wlk., C. B. Mus., Het., XII, 694, *Anthœcia*.
1864. Grt., Proc. Ent. Soc. Phil., II, 343, pl. VI, f. 6, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 120, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria*.
1875. Grt., Check List Noctuidæ, 18, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 230, *Schinia*.

HABITAT.—Massachusetts to Florida, west to the Mississippi; Alabama in September.

The type is in the British Museum.

S. roseitincta Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 278, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 248, *Lygranthœcia*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 124, *Lygranthœcia*.
1891. Smith, List Lepidoptera, 54, *Schinia*.
exaltata Hy. Edw.
1884. Hy. Edw., Papilio, IV, 124, *Melicleptria*.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 124, pr. syn.

HABITAT.—Texas, April and June; Colorado.

Dr. Harvey's type is in the British Museum, while typical specimens of Mr. Edwards' species are in his collection. They are alike specifically, as I have already stated.

S. saturata Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 74, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 230, *Schinia*.
rubiginosa Strk.
1876. Strk., Lep. Rhop. et Het., 122, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 230, pr. syn.

HABITAT.—Massachusetts; Texas; Kansas; Southern California; Georgia in October; Florida.

Mr. Grote's type should be in the collection of the American Entomological Society, but I have not found it there. Mr. Strecker's type is in his own collection. In the British Museum are specimens labeled by Mr. Grote which are the same as the species described by me in the "Revision."

S. diffusa Smith.*

1891. Smith, Trans. Am. Ent. Soc., xviii, 125, *Schinia.*

HABITAT.—South Park, Colorado.

The types are in the National Museum.

S. sordida Smith.*

1883. Smith, Trans. Am. Ent. Soc., x, 230, *Schinia.*

HABITAT.—Selma, Alabama; Texas.

The type is in the National Museum.

S. tertia Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 212, *Tamila.*
1875 Grt., Bull. Buff. Soc. Nat. Sci., ii, 220, *Tamila.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 10, *Tamila.*
1882. Smith, Trans. Am. Ent. Soc., x, 231, *Schinia.*

HABITAT.—Texas, May, September, and October.

The type is in the British Museum.

S. albafascia Smith.*

1883. Smith, Trans. Am. Ent. Soc., x, 231, *Schinia.*

HABITAT.—Utah, Fort Thornburgh; South Park, Colorado, August.

The type is in the U. S. National Museum.

S. regia Strk.*

1876. Strk., Lep. Rhop. et Het., 121, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 231, *Schinia.*

HABITAT.—Kansas; Texas; Colorado.

The type is with Mr. Strecker.

S. sanguinea Geyer.

1832. Geyer, Zutræge, iv, 9, ff. 613, 614, *Oria.*
1852. Gn., Spec. Gen., Noct., ii, 167, *Oria.*
1857. Wlk., C. B. Mus., Het., xi, 672, *Oria.*
1865. Grt., Proc. Ent. Soc. Phil., iii, 4, *Oria.*
1877. Grt., Bull. Geol. Surv., iii, 798, *Porrima.*
1883. Smith, Trans. Am. Ent. Soc., x, 232, *Schinia.*
carmosina Neum.
1883. Neum., Papilio, iii, 142, *Schinia.*
1891. Smith, List Lepid., 54, pr. syn.

HABITAT.—Southern States; Florida; Texas.

Mr. Neumœgen's type is in his own collection. Mr. Neumœgen called attention to the fact that two forms were confused under the term *sanguinea* and described the smaller and most intensely colored form as *carmosina*. Unfortunately that is exactly the form figured by Geyer, and Mr. Strecker had previously recognized that fact and described as *gloriosa* the larger, paler form.

S. gloriosa Strk.*

1876. Strk., Lep. Rhop. et Het., 132, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., xviii, 249, *Heliothis*.
sanguinea ‡ Neum.
1883. Neum., Papilio, iii, 142, *Schinia*.

HABITAT.—Texas.

The type is with Mr. Strecker.

S. cupes Grt.

1875. Grt., Trans. Am. Ent. Soc., v, 113, *Heliothis*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 311, pl. iii, f. 4, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 232, *Schinia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 165, *Heliothis*.
1890. Grt., Revised Check List, 36, *Trichosellus*.
crotchii Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 135, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 232, pr. syn.

HABITAT.—Texas, May; Colorado; Oregon; Washington; California.

The types, both of *cupes* and *crotchii* are in the British Museum.

S. jaguarina Gn.*

1852. Gn., Spec. Gen., Noct., ii, 184, pl. 9, f. 11, *Anthœcia*.
1857. Wlk., C. B. Mus., Het., xi, 694, *Anthœcia*.
1864. Grt., Proc. Ent. Soc. Phil., iii, 528, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 120, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 126, *Melicleptria*.
1877. Uhler, Bull. Geol. Surv., iii, 769, *Anthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 232, *Schinia*.

HABITAT.—Georgia; Nebraska in August; Colorado; Kansas; Texas.

The type is with M. Oberthür, at Rennes.

S. arcifera Gn.*

1852. Gn., Spec. Gen., Noct., ii, 184, *Anthœcia arcigera*.
1852. Gn., Spec. Gen., Noct., iii, 399, *Anthœcia arcifera*.
1857. Wlk., C. B. Mus., Het., xi, 694, *Anthœcia*.
1863. Grt., Proc. Ent. Soc. Phil., ii, 340, pl. vi, f. 3, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 119, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 34, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., x, 232, *Schinia*.
spraguei Grt.
1863. Grt., Proc. Ent. Soc. Phil., ii, 340, pl. vi, ff. 4, 5, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 120, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 34, *Melicleptria*.
1875. Morr., Proc. Bost. Soc. N. H., xviii, 123, pr. syn.
1883. Smith, Trans. Am. Ent. Soc., x, 232, *Schinia*.

HABITAT.—Eastern and Middle States, August and September; New Mexico; Texas; Kansas.

Guenee's type is the Oberthür collection. I have not been able to locate Mr. Grote's type. Mr. Grote described from a number of specimens from various collections. The two names seem to refer to the sexes and not to distinct varieties.

S. petulans Hy. Edw,

1884. Hy. Edw., Papilio, IV, 123, *Anthœcia.*

HABITAT.—Florida.

The type is in Mr. Neumœgen's collection.

S. spinosæ Gn.*

1852. Gn., Spec. Gen., Noct., II, 182, pl. IX, f. 10, *Heliothis.*
1857. Wlk., C. B. Mus., Het., XI, 687, *Heliothis.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 118, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 233, *Schinia.*
1890. Grt., Revised Check List, 34, *Eupanychis.*
hirtella G. & R.
1866. G. & R., Proc. Ent. Soc. Phil., VI, 19, pl. III, f. 3, *Anthœcia.*
1868. G. & R., Trans. Am. Ent. Soc., III, 180, pr. syn.
1870. Grt., Trans. Am. Ent. Soc., IV, 432, pr. syn.

HABITAT.—Canada; Eastern, Middle, and Central States.

Guenee's type came from the Coll. Feisthamel—where that is at present, I can not say. The whereabouts of the Grote & Robinson type is also unknown to me. It is one of the species that should be in the collection of the American Entomological Society.

S. crenilinea Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 129, *Schinia.*

HABITAT.—Southern Texas.

The types are in the Neumœgen collection.

S. lupatus Grt.

1875. Grt., Can. Ent., VII, 224, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 233, *Schinia.*
1883. Grt., Can. Ent., XV, 128, *Heliothis.*

HABITAT.—Texas.

The type of this species is in the British Museum. The foretibiæ have one inner and one outer claw or spine. Wing form of *Schinia.* Looks like an *Aletia* at first sight, with a small black orbicular, and a black, white-lined reniform. I am not at all sure that I had this species before me in 1883, and at all events have not had it since.

S. packardii Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 528, pl. VI, f. 2, *Anthœcia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 120, *Heliothis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria.*
1877. Grt., Bull. Geol. Surv., III, 798, *Lyranthœcia.*
1883. Smith, Trans. Am. Ent. Soc., x, 234, *Schinia.*

mortua Grt.
1864. Grt., Proc. Ent. Soc. Phil., III, 528, pl. VI, f. 1, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 120, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria*.
1877. Grt., Bull. Geol. Surv., III, 798, ? pr. syn.
1883. Smith, Trans. Am. Ent. Soc., X, 234, *Schinia*.
nobilis Grt.
1864. Grt., Proc. Ent. Soc. Phil., III, 529, pl. VI, f. 3, *Anthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 120, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, ? *packardii*, var.
1883. Smith, Trans. Am. Ent. Soc., X, 234, *Schinia*.

HABITAT.—Texas, Arizona, Colorado.

The types are all in the collection of the American Entomological Society. The differences between them consist in the relative distinctness of the maculation, the discal and basal black spot of secondaries disappearing entirely in *mortua*. In retaining the term *packardii* for this species instead of *mortua*, which has priority by half a page, I feel sure that I am in accord with Mr. Grote's wishes on the subject.

S. bicuspida Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 127, *Schinia*.

HABITAT.—Southern Texas.

The type is with Mr. Neumœgen.

S. thoreaui G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., III, 181, pl. II, f. 80, *Anthœcia*.
1870. G. & R., Trans. Am. Ent. Soc., IV, 432, *Lygranthœcia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 115, *Lygranthœcia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 33, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., X, 234, *Schinia*.

HABITAT.—Texas; Alabama; Kansas; Indiana.

I have not seen the type, nor do I know where it is.

S. marginata Haw.*

1810. Haw., Lep. Britt., 374, *Crambus*.
1834. Steph., Ill. Brit. Ent., Haust., IV, 26, *Pyralis*.
1836. Wood, Ind. Ent., pl. 54, f. 68, *Pyralis*.
1852. Gn., Spec. Gen., Delt., 128, *Anthœcia*.
1857. Westw. & Humph., Brit. Moths, II, 91-92, *Pyralis*.
1863. Grt., Proc. Ent. Soc. Phil., II, 339, *Anthœcia*.
1870. G. & R., Trans. Am. Ent. Soc., IV, 432, *Lygranthœcia*.
rivulosa Gn.
1852. Gn., Spec. Gen., Noct., II, 184, pl. IX, f. 12, *Anthœcia*.
1854. Gn., Spec. Gen., Delt., 128, pr. syn.
1857. Wlk., C. B. Mus., Het., XI, 694, *Anthœcia*.
1863. Grt., Proc. Ent. Soc. Phil., II, 339, *Anthœcia*.
1883. Smith, Trans. Am. Ent. Soc., X, 234, *Schinia*.
divergens Wlk.
1857. Wlk., C. B. Mus., Het., XII, 836, *Microphysa*.
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.
contracta Wlk.
1857. Wlk., C. B. Mus., Het., XII, 836, *Microphysa*.

1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
designata Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 958, *Euclidia.*
1868. G. & R., Trans. Am. Ent. Soc., II, 87, pr. syn.

HABITAT.—Middle, southern, and central States, July and August.

A typical specimen of Guenée's species and all of Walker's types are in the British Museum. I did not see that of *M. divergens;* but the others are as referred by Messrs. Grote and Robinson and I have no doubt this is also correctly placed in the synonymy.

S. digitalis Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 128, *Schinia.*

HABITAT.—Dallas, Texas.

The type is in the National Museum.

S. constricta Hy. Edw.

1882. Hy. Edw., Papilio, II, 128, *Lygranthœcia.*
1883. Smith, Trans. Am. Ent. Soc., X, 235, *Schinia.*

HABITAT.—North Carolina.

The type is in Mr. Neumœgen's collection.

S. tuberculum Hbn.

1823. Hbn., Zuträge, III, 517, 518, *Melicleptria.*
1852. Gn., Spec. Gen., Noct., II, 185, *Anthœcia.*
1857. Wlk., C. B. Mus., Het., XI, 695, *Anthœcia.*
1863. Grt., Proc. Ent. Soc. Phil., II, 343, *Anthœcia.*
1864. Grt., Proc. Ent. Soc. Phil., III, 531, *Melicleptria.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 119, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., X, 247, *Anthœcia.*
dorsilutea Wlk.
1857. Wlk., C. B. Mus., Het., XI, 695, *Anthœcia.*

HABITAT.—Pennsylvania; Georgia; Florida.

The type of *dorsilutea* is the same as the *tuberculum* of the Grote collection, which I believe to be correctly identified. The fore tibiæ have one inner and two outer claws. In appearance the species resembles *lynx;* but the median and s. t. lines are more ragged, median space narrower, ordinary spots not distinct; black border of secondaries broad. Walker's species is from "locality unknown."

S. brevis Grt.*

1864. Grt., Proc. Am. Ent. Soc., III, 530, pl. VI, f. 4, *Anthœcia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 119, *Heliothis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria.*
1883. Smith, Trans. Am. Ent. Soc., X, 235, *Schinia.*
var. atrites Grt.*
1864. Grt., Proc. Am. Ent. Soc., III, 530, pl. VI, f. 5, *Anthœcia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 119, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., X, 235, *Schinia.*

HABITAT.—Colorado; New Mexico; Illinois and Massachusetts in September; New York; Iowa.

The types should be in Philadelphia in the Coll. American Ent. Soc., but I have not been able to find them there.

S. septentrionalis Wlk.

1858. Wlk., C. B. Mus., Het., xv, 1744, *Omia*.

HABITAT.—Illinois.

This seems a good species, the type of which is in the British Museum. There are two inner and three outer claws to the fore tibia. Secondaries black; primaries very dark; terminal space a little lighter; median space with a little yellow intermixed; median lines narrow, white.

S. concinna Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 128, *Schinia*.

HABITAT.—Southern Texas.

The type is in the Neumœgen collection.

S. errans Smith.*

1883. Smith, Trans. Am: Ent. Soc., x, 235, *Schinia*.

HABITAT.—Arizona.

The type is in the National Museum.

S. inclara Strk.

1876. Strk., Lep. Rhop. et Het., 122, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 235, *Schinia*.

HABITAT.—Texas.

The type is with Mr. Strecker.

S. meskeana Grt.*

1875. Grt., Can. Ent., VII, 234, *Lygranthœcia*.
1881. Grt., Papilio, I, 157, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 235, *Schinia*.
fastidiosa Strk.
1876. Strk., Lep. Rhop. et Het., 121, *Heliothis*.
1876. Grt., Can. Ent., VIII, 26, pr. syn.
rufimedia Grt.
1883. Grt., Bull. Bkln. Ent. Soc., III, 31, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 235, pr. syn.

HABITAT.—Texas; Florida.

The types of Mr. Grote's species are in the British Museum, and a specimen of *rufimedia*, also marked "type" by Mr. Grote, is in the Hulst collection. The only observable difference between them is that *rufimedia* has a little more black on the secondaries. Mr. Strecker's type is in his own collection.

S. limbalis Grt.

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 421, *Lygranthœcia*.
1883. Smith, Trans. Am. Ent. Soc., x, 247, *Lygranthœcia*.

HABITAT.—Kansas.

The type is in the British Museum and is a species I had not before seen. The tibial armature can not be made out as the legs are curled under in the specimen. It resembles *arcifera*, but is smaller and without median lines.

S. ultima Strk.*

1876. Strk., Lep. Rhop. et Het., 122, *Heliothis*
1881. Grt., Papilio, I, 157, *Lygranthœcia.*
1883. Smith, Trans. Am. Ent. Soc., x, 236, *Schinia.*

HABITAT.—Texas.

The type is in the Strecker collection.

G. scissa Grt.*

1876. Grt., Proc. Bost. Soc. N. H., XVIII, 451, *Lygranthœcia.*
1883. Smith, Trans. Am. Ent. Soc., x, 252, *Schinia.*
1890. Grt., Revised Check List, 36, *Canidia.*

HABITAT.—Florida.

The type is in the British Museum. It looks more like *Melicleptria* than the specimen retained by Mr. Thaxter. Mr. Grote's genus is based, apparently, on the characters I pointed out, but if the species is removed from *Schinia*, it must go to *Pseudotamila.*

S. siren Strk.

1876. Strk., Lep. Rhop. et Het., 122, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 248, *Heliothis.*

HABITAT.—Texas.

The type is with Mr. Strecker. The tibial armature is as in *ultima.*

S. nubila Strk.

1876. Strk., Lep. Rhop. et Het., 122, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 248, *Heliothis.*

HABITAT.—Texas.

The type is with Mr. Strecker. The tibial armature is as in *ultima.*

S. lanul Strk.

1877. Strck., Lep. Rhop. et Het., 132, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 249, *Heliothis.*

HABITAT.—Texas.

The type is with Mr. Strecker. The anterior tibiæ have an inner and four outer claws, and the species is thus related to *tertia.*

By a regretable oversight the three last-named species were omitted from my list of Lepidoptera. The accident happened because in my Revision they were among the unknown species, and, after seeing the types and annotating my copy, I failed to enter them in the list of species where they belonged.

Genus **DASYSPOUDEA** Smith.

1883. Smith, Trans. Am. Ent. Soc., x, 213.

D. lucens Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 69, *Heliothis*.
1882. Grt., Can. Ent., xiv, 175, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 214, *Dasyspoudea*.
var. **luxuriosa** Grt.
1882. Grt., Can. Ent., xiv, 175, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 214, pr. syn.

HABITAT.—Nebraska; Montana; Colorado; New Mexico.

I have not seen Mr. Morrison's type, nor do I know where it is at present. The type of the variety is with Mr. Neumœgen.

D. meadii Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 121, pl. 3, f. 5, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 35, et 220, *Tamila*.
1879. Strk., Rept. Chief Eng., 1878-'79, p. 1862, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 214, *Dasyspondea*.

HABITAT.—Montana; Colorado in July; Black Hills.

The type is in the British Museum.

Genus **PSEUDANTHŒCIA** Smith.

1883. Smith, Trans. Am. Ent. Soc., x, 213.

P. tumida Grt.*

1880. Grt., Bull. Bkln. Ent. Soc., III, 30, *Lygranthœcia*.
1882. Grt., Can. Ent., xiv, 186, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 213, *Pseudanthœcia*.

HABITAT.—Colorado.

Mr. Grote had specimens from his own collection and from those of Tepper and Neumœgen; but neither in the British Museum nor in the Tepper collection is there a "type."

Genus **STYLOPODA** Smith.

1891. Smith, Trans. Am. Ent. Soc., XVIII, 131.

S. cephalica Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 131, *Stylopoda*.

HABITAT.—California.

The type is in the National Museum.

Genus **SYMPISTIS** Hbn.

1816. Hübner, Verzeichniss, 257.

S. proprius Hy. Edw.

1881. Hy. Edw., Papilio, I, 19, *Euros*.
1883. Smith, Trans. Am. Ent. Soc., x, 213, *Sympistis*.

HABITAT.—Siskiyou County, California.

The type is in the Edwards collection.

Genus **PSEUDOTAMILA** Smith.

1883. Smith, Trans. Am. Ent. Soc., x, 238.

P. vanella Grt.*

1877. Grt., Can. Ent., xi, 197, *Tamila*.
1883. Smith, Trans. Am. Ent. Soc., x, 239, *Pseudotamila*.

HABITAT.—Nevada; California.

The type is in the British Museum.

P. perminuta Hy. Edw.

1881. Hy. Edw., Papilio, i, 21, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., x, 239, *Pseudotamila*.

HABITAT.—Sierra Nevada, California.

The types are in the Edwards collection.

Genus **MELAPORPHYRIA** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 75.

M. immortua Grt.*

1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 75, 220, *Melaporphyria*.
1883. Smith, Trans. Am. Ent. Soc., x, 237, *Melaporphyria*.

HABITAT.—Massachusetts and New York in June; Colorado.

The type is in Dr. Lintner's collection at Albany.

M. prorupta Grt.

1873. Grt., Trans. Am. Ent. Soc., iv, 294, *Heliothis*.
1873. Grt., Bull Buff. Soc. Nat. Sci., i, 118, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., x, 238, *Melaporphyria*.
venusta Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 133, *Melicleptria*.
1878. Grt., Bull. Geol. Surv., v, 183, pr. syn.

HABITAT.—California; Oregon.

The types should be in the American Ent. Society's collection; but I have not seen them there.

M. belladonna Hy. Edw.

1081. Hy. Edw., Papilio, i, 20, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., x, 238, *Melaporphyria*.
1890. Grt., Revised Check List, 34, *Dysocnemis*.

HHBITAT.—Utah.

The types are in the Edwards and Neumœgen collections.

M. oregona Hy. Edw.*

1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 135, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., x, 138, = *ononis*
1891. Butler, Entomologist, xxiv, 293, an sp. dist.

HABITAT.—Colorado; Nevada; Oregon.

Mr. Butler is quite correct in separating Mr. Edwards's species from *ononis*; but he is in error in charging Mr. Grote with the combination.

The blunder was mine, based on insufficient material. I am much less ready nowadays to believe in the specific identity of European and American species. *Oregona* is near to and represents *ononis*, as *phlogophagus* represents *dipsaceous*. So, also, Mr. Butler seems not to know that I am responsible for uniting *Adonisea* with *Melicleptria*, a union which I still consider perfectly proper.

Genus **MELICLEPTRIA** Hbn.

1816. Hübner, Verzeichniss, 262.

M. celeris Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 148, *Melicleptria*.
1882. Grt., New List, 36, *Euros*.
1882. Grt., Can. Ent., XIV, 171, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 244, *Melicleptria*.

HABITAT.—Southern California.

The type is in the Edwards collection.

M. pulchripennis Grt.*

1874. Grt., Proc. Bost. Soc. N. H., XVI, 241, *Melicleptria*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Adonisea*.
1882. Grt., Ill. Essay, 62, pl. III, f. 31, *Adonisea*.
1883. Smith, Trans. Am. Ent. Soc., X, 244, *Melicleptria*.
languida Hy. Edw.
1881. Hy. Edw., Papilio, I, 20, pr. var.
1883. Smith, Trans, Am. Ent. Soc., X, 244, pr. syn.

HABITAT.—California; Colorado.

I have not seen the type. The British Museum specimens seem not to be such; but are the species commonly so known in American collections.

M. græfiana Tepper.

1883. Tepper, Trans. Am. Ent. Soc., X, 245, *Melicleptria*.

HABITAT.—Southern California.

The type is in the Tepper collection.

M. villosa Grt.*

1864. Grt., Proc. Ent. Soc. Phil., III, 531, pl. VI, f. 6, *Melicleptria*.
1868. G. R., Trans. Am. Ent. Soc., III, 181, *Anthœcia*.
1883. Smith, Trans. Am. Ent. Soc., X, 244, *Melicleptria*.
pauxillus Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 118, pl. III, f. 6, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., X, 244, pr. syn.
var. **persimilis** Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 117, pl. III, f. 11, *Heliothis*.
1883. Smith, Trans. Am. Ent. Soc., X, 244, pr. syn.

HABITAT.—Colorado; California.

The type of *villosa* should be in the collection of the American Entomological Society; but I have not found it there. The type of *pauxillus* is in the Tepper collection; a type of *persimilis* is in the British Museum, and another specimen, also marked "type," is in the Tepper collection.

M. honesta Grt.

1881. Grt., Papilio, I, 77, *Melicleptria.*
1883. Smith, Trans. Am. Ent. Soc., x, 245, *Melicleptria.*

HABITAT.—Mount Hood, Oregon.

The type is in the Neumœgen collection.

M. sueta Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 117, pl. III, f. 10, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 245, *Melicleptria.*
californicus Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 149, *Heliothis.*
1883. Smith, Trans. Am. Ent. Soc., x, 245, pr. syn.

HABITAT.—Colorado; California.

Types of both names are in the Tepper collection, and a specimen of *californicus*, also marked "type," is in the British Museum.

M. vacciniæ Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 134, *Melicleptria.*
1883. Smith, Trans. Am. Ent. Soc., x, 251, *Melicleptria.*

HABITAT.—Sierra Nevada, California.

The type is in the Edwards collection.

M. septentrionalis Hy. Edw.*

1884. Hy. Edw., Papilio, IV, 45, *Melicleptria.*

HABITAT.—Hudson Bay Territory.

The types are in the Neumœgen collection. Mr. Neumœgen thinks this is the same as *ononis* Fab. He may be right; I have not compared them.

Genus **HELIOLONCHE** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 115.

H. modicella Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 116, pl. III, f. 12, *Heliolonche.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Heliolonche.*
1883. Smith, Trans. Am. Ent. Soc., x, 242, *Heliolonche.*

HABITAT.—California, in June; Colorado.

The type is in the British Museum.

Genus **HELIOSEA** Grt.

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220.

H. pictipennis Grt.

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Heliosea.*
1882. Grt., Ill. Essay, 62, pl. III, f. 32, *Heliosea.*
1883. Smith, Trans. Am. Ent. Soc., x, 239, *Heliosea.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 172, *Heliosea.*

HABITAT.—California.

The type is in the British Museum; it has no legs, no head, and only two wings. Whether it was in that condition when the figure was made I can not say, of course.

Genus **HELIOPHANA** Grt.

1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220.

H. mitis Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 116, pl. III, f. 7, *Melicleptria.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Heliophana.*
1883. Smith, Trans. Am. Ent. Soc., X, 240, *Heliophana.*
obliquata Smith.
1891. Smith, Trans. Am. Ent. Soc., XVIII, 131, *Heliophana.*

HABITAT.—Texas; Mississippi.

Mr. Grote's type is in the British Museum; my type is with Mr. Neumœgen. The two are but forms of one species, as I rather suspected when describing *obliquata.*

H. amaryllis Smith.*

1891. Smith, Trans. Am. Ent. Soc., XVIII, 130, *Heliophana.*

HABITAT.—California.

The type is in the National Museum.

H. bina Gn.

1852. Gn., Spec. Gen., Noct., II, 186, *Anthœcia.*
1857. Wlk., C. B. Mus., Het., XI, 695, *Anthœcia.*
1863. Grt., Proc. Ent. Soc. Phil., II, 334, *Anthœcia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 119, *Heliothis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 220, *Heliophana.*
1883. Smith, Trans. Am. Ent. Soc., X, 240, *Heliophana.*

HABITAT.—Nebraska; New York in June.

The type, which I have not seen, is with M. Oberthür, at Rennes.

Genus **XANTHOTHRIX** Hy. Edw.

1878. Hy. Edw., Proc. Cal. Ac. Sci., Pac. Coast Lep., No. 29.

X. ranunculi Hy. Edw.*

1878. Hy. Edw., Proc. Cal. Ac. Sci., Pac. Coast Lep., No. 29, July 1, 1878.
1883. Smith, Trans. Am. Ent. Soc., X, 241, *Xanthothrix.*

HABITAT.—California.

The type is in the Edwards collection. I have the paper in which it is described only as a separate and believe, indeed, that it has not been published in any other way.

X. neumœgeni Hy. Edw.*

1881. Hy. Edw., Papilio, I, 101, *Xanthothrix.*
1882. Grt., Papilio, II, 122, *Euedwardsia.*
1883. Smith, Trans. Am. Ent. Soc., X, 241, *Xanthothrix.*
1883. Grt., Proc. Am. Phil. Soc., XXI, 165, *Euedwardsia.*

HABITAT.—California.

Types are in the Edwards and Neumœgen collections.

Genus **AXENUS** Grt.

1873. Grt. Bull. Buff. Soc. Nat. Sci., I, 152.

A. arvalis Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 152, pl. IV, f. 8, *Axenus*.
1883. Smith, Trans. Am. Ent. Soc., X, 242, *Axenus*.
var. **ochraceus** Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 136, pr. var.
var. **amplus** Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 136, pr. var.

HABITAT.—Colorado; California.

Mr. Grote's type is in the British Museum; types of the varieties are in the Edwards collection. It is questionable whether these names can be retained, as a good series from any locality shows all the forms, with all intermediate variations.

Genus **HELIACA** H. Sch.

1853. H. Sch., Schmett. Eur., II, 370.

H. diminutiva Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 148, *Heliothis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 34, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 245, *Heliaca*.

HABITAT.—California; Nevada; Colorado, South Park.

Types are in the Tepper collection and in the British Museum.

H. fasciata Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 134, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 246, *Heliaca*.

HABITAT.—Plover Co., Colorado.

The type is in the Edwards collection.

H. dubitans Tepper.

1883. Tepper, Trans. Am. Ent. Soc., X, 246, *Heliaca*.

HABITAT.—Nevada.

The type is in the Tepper collection.

H. nexilis Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 102, *Eutricopis*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 246, *Heliaca*.
elaborata Hy. Edw.
1881. Hy. Edw., Papilio, I, 21, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 246, pr. syn.

HABITAT.—Colorado; California in June.

Mr. Morrison's type is in the Tepper collection; Mr. Edwards's type is in his own collection.

Genus **ANARTA** Ochs.

1816. Ochs., Schmett. Eur., IV, 90.

A. acadiensis Beth.*

1869. Beth., Trans. Nov. Sc. Inst. Nat. Sci., II, 84, figure, *Anarta.*
1869. Beth., Can. Ent., II, 64, *Anarta.*

HABITAT.—Nova Scotia.

The type is with Dr. Bethune. The species has been referred with more or less doubt to *myrtilli* Linn., and it may be that species. I am by no means satisfied that such is the case, however, and prefer to retain Dr. Bethune's name until careful comparisons can be made.

A. cordigera Thunb.*

1788. Thunb., Mus. Nat. Ac. Ups. Diss., pt. VI, 72, f. 4, *Noctua.*
1816. Hbn., Verzeichniss, 220, *Anarta.*
1852. Gn., Spec. Gen., Noct., II, 194, *Anarta.*
1857. Wlk., C. B. Mus., Het., XI, 702, *Anarta.*
1860. Moeschl., Wien. Ent. Monatschr., IV, 367, *Anarta.*
luteola G. & R.
1865. G. & R., Proc. Ent. Soc. Phil., IV, 493, pl. III, ff. 5 and 6, *Anarta.*
1869. Beth., Can. Ent., I, 87, *Anarta.*
1873. Strk., Lep. Rhop. et. Het., 40, pr. syn.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 31, pr. syn.

HABITAT.—Canada; Labrador; Colorado.

The type of Grote and Robinson's species should be in the collection of the American Entomological Society, and Mr. Strecker speaks of seeing it there in 1873. I have not found it from 1882, when I made my first notes on the collection, to 1891, when I again went over all the arranged material and found some few species previously overlooked.

A. melaleuca Thunb.*

1791. Thunb., Ins. Suec., pars II, 42, *Noctua.*
1816. Hbn., Samml. Eur. Schmett., II, pl. 415, *Sympistis.*
1852. Gn., Spec. Gen., Noct., II, 193, *Anarta.*
1857. Wlk., C. B. Mus., Het., XI, 699, *Anarta.*
1860. Mœschl., Wien. Ent. Monatschr., IV, 367, *Anarta.*
1874. Grt., Proc. Bost. Soc. N. H., XVI, 244, *Anarta.*
bicycla Pack.
1867. Pack., Proc. Bost. Soc. N. H., XI, 41, *Anarta.*
1871. Stgr., Cat. Lep. Eur., 128, pr. syn.
1874. Grt., Proc. Bost. Soc. N. H., XVI, 244, pr. syn.

HABITAT.—Labrador.

Dr. Packard's type is in the collection of the Mus. Comp. Zoölogy at Cambridge. Mr. Morrison has labelled a specimen now in the National Museum as a "type," of *bicycla.*

A. melanopa Thunb.*

1791. Thunb., Diss. Ent., II, 42, f. 12, *Noctua.*
1829. Bdv., Ind. Meth., 161, *Anarta.*
1852. Gn., Spec. Gen., Noct., II, 190, *Anarta.*

1857. Wlk., C. B. Mus., Het., xi, 697, *Anarta.*
1879. Grt., Bull. U. S. Nat. Mus., xv, 160, *Anarta.*
1875. Morr., Psyche, i, 44, *Anarta.*
nigrolunata Pack.
1867. Pack., Proc. Bost. Soc. N. H., xi, 40, *Anarta.*
1871. Stgr., Cat. Lep. Eur., 128, pr. syn.
1874. Grt., Proc. Bost. Soc. N. H., xvi, 244, pr. syn.

HABITAT.—Labrador in July; Mt. Washington, New Hampshire; South Park, Colorado; Rocky Mts., 13,000 feet; Arctic America.

Dr. Packard's type is at Cambridge, in the Museum of Comparative Zoölogy.

A. quadrilunata Grt.*

1874. Grt., Proc. Bost. Soc. N. H., xvi, 244, *Anarta.*

HABITAT.—Colorado.

The type is in the British Museum.

A. schœnherri Zett.*

1840. Zett., Ins. Lapp., 950, *Anarta.*
1861. Stgr., Stett. Ent. Zeit., 1861, 373, *Anarta.*
leucocycla Stgr.
1857. Stgr., Stett. Ent. Zeit., 1857, 296, *Anarta.*
1860. Moeschl., Wien. Ent. Monatsch., iv, 367, pl. ix, f. 6, *Sympistis.*
1861. Stgr., Stett. Ent. Zeit., 1861, 373, pr. syn.

HABITAT.—Labrador; Greenland; Lapland.

The Staudinger type is in his own collection. Perhaps it may be well to state that in my citations in this genus, in which so many species are circumpolar, I have not attempted to refer to well established European synonymy, nor to give references to all works in which the European insects are treated. I have tried only to credit the species and to give reference to the works more usually accessible to American students, following Staudinger in the bibliography.

A. richardsoni Curt.*

1834. Curt., App. to Ross, Narr. 2nd Voy., 72, pl. A, f. 11, *Hadena.*
1857. Wlk., C. B. Mus., Het., xi, 706, *Anarta.*
1867. Pack., Proc. Bost. Soc. N. H., xi, 39, *Anarta.*
algida Lef.
1836. Lef., Ann. Soc. Ent. Fr., v, 395, pl. x, f. 5, *Anarta.*
1852. Gn., Spec. Gen., Noct., ii, 192, *Anarta.*
1857. Wlk., C. B. Mus., Het., xi, 699, *Anarta.*
1860. Moeschl., Wien. Ent. Monatsch., iv, 367, *Anarta.*
1871. Stgr., Cat. Lep. Eur., 128, pr. syn.
septentrionis Wlk.
1857. Wlk., C. B. Mus., Het., xi, 700, *Anarta.*
1891. Butler, Entomologist, xxiv, 293, pr. syn.

HABITAT.—Labrador in August; Repulse Bay; Lapland; Polaris Bay.

Walker's type is in the British Museum, and is the same as the *richardsonii* of the Grote and other collections.

A. secedens Wlk.

1857. Wlk., C. B. Mus., Het., XII, 913, *Plusia*.

HABITAT.—Hudson's Bay territory.

The type is in the British Museum. It is a yellow winged *Anarta* in poor condition, and seems different from anything else in the collection. On the primaries the narrow, irregular, dentate, white s. t. line is followed by dark spots, and on the secondaries the outer black band is not defined.

A. impingens Wlk.*

1857. Wlk., C. B. Mus., Het., XI, 700, *Anarta*.
nivaria Grt.
1875. Grt., Ann. Lyc. Nat. Hist. N. Y., XI, 107, *Anarta*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, = *curta*.
curta Morr.
1875. Morr., Ann. Lyc. Nat. Hist. N. Y., XI, 96, *Mamestra*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Anarta*.
1880. Grt., Can. Ent., XII, 186. = *nivaria*.
1881. Grt., Can. Ent., XIII, 126, *Anarta*.
perpura Morr.
1875. Morr., Proc. Ac. Nat. Sci., Phil., 1875, 66, *Orthosia*.
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, = *curta*.
1880. Grt., Can. Ent., XII, 186, = *nivaria*.

HABITAT.—Colorado in July; "Rocky Mts."

Walker's type is in the British Museum; Mr. Grote's type I have not seen; Morrison's types are both in the Tepper collection. The locality, New York, given by Mr. Morrison for *O. perpura*, is certainly an error. Mr. Butler, from the specimens before him, suggests (Entomologist, XXIV, 293) that *impingens* is near to *nivaria*, but from my knowledge of other specimens I made the reference positively before Mr. Butler's note appeared.

A. membranosa Morr.

1875. Morr., Ann. Lyc. Nat. Hist. N. Y., XI, 101, *Anarta*.

HABITAT.—White Mts., New Hampshire.

Mr. Morrison's type is probably in the Museum of the Boston Society of Natural History; but I have no memorandum of having seen it there.

A. lapponica Thunb.

1792. Thunb., Diss. Ent., II, 42, f. 10, *Noctua*.
1861. Stgr., Stett. Ent. Zeit., 1861, 381, *Anarta*.
amissa Lefb.
1836. Lefb., Ann. Soc. Ent. Fr., V, 397, pl. X, f. 6, *Anarta*.
1852. Gn., Spec. Gen., Noct., II, 192, *Anarta*.
1857. Wlk., C. B. Mus., Het., XI, 698, *Anarta*.
1860. Moeschl., Wien. Ent. Monatschr., IV, 367, *Anarta*.
1861. Stgr., Stett. Ent. Zeit., 1861, 381, pr. syn.

HABITAT.—Greenland; Labrador.

A. kelloggi Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 133, *Anarta.*

HABITAT.—Tuolumne Co., California.

The type is in the Edwards collection.

A. zetterstedtii Stgr.*

1857. Stgr., Stett. Ent. Zeit., 1857, 294, *Anarta.*
1860. H. Sch., Neue Schmett. Eur., f. 166, *Anarta.*
1874. Moeschl., Stett. Ent. Zeit., 1874, 317, *Anarta.*

HABITAT.—Labrador; Lapland.

The type is with Dr. Staudinger.

A quieta Hbn.

1805. Hbn., Schmett. Eur., Noct., 485, *Noctua.*
1852. Gn., Spec. Gen., Noct., II, 193, pl. VII, f. 11, *Anarta.*
1857. Wlk., C. B. Mus., Het., XI, 701, *Anarta.*
1861. Stgr., Stett. Ent. Zeit., 1861, 378, *Anarta.*
constricta Wlk.
1857. Wlk., C. B. Mus., Het., XI, 701, *Anarta.*
1891. Butler, Entomologist, XXIV, 293, pr. syn.
rigida Wlk.
1857. Wlk., C. B. Mus., Het., XI, 701, *Anarta.*
1891. Butler, Entomologist, XXIV, 293, pr. syn.

HABITAT.—Arctic coast of America. Lat. 67½–68.

Walker's types are in the British Museum and Mr. Butler's references to *quieta* agree with my own notes.

A. funebris Hbn.

1804. Hbn., Schmett. Eur., Noct., pl. 92, f. 433, *Noctua.*
1825. Tr., Schmett. Eur., V, 209, *Anarta.*
1852. Gn., Spec. Gen., Noct., II, 191, *Anarta.*
1857. Wlk., C. B. Mus., Het., XI, 698, *Anarta.*
1860. Moeschl., Wien. Ent. Monatschr., IV, 370, *Sympistis.*

HABITAT.—Labrador.

It is perhaps a little questionable whether Moeschler's specimens are really the European species. I have not seen them.

A. mimula Grt.

1883. Grt., Trans. Kans. Ac. Sci., VIII, 48, *Mamestra.*

HABITAT.—New Mexico.

The type is with Prof. Snow, to whose courtesy I owe the chance to examine the species and to make the above generic reference.

A. mimuli Behr.

1885. Behr, Bull. Cal. Ac. Sci., 1885, 62, *Anarta.*

HABITAT.—California.

I presume Dr. Behr has his type. I have not tried to identify the species.

Genus **ANNAPHILA** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 149.

A. diva Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 150, pl. IV, f. 14, *Annaphila.*

HABITAT.—California.

The type is in the British Museum.

A. casta Hy. Edw.

1890. Hy. Edw., Ento. Amer., IV, 114, *Annaphila.*

HABITAT.—Oregon.

The type is in the British Museum.

A. superba Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 139, *Annaphila.*
1882. Grt., Ill. Essay, 60, pl. III, f. 28, *Annaphila.*

HABITAT.—California.

The type is in the Edwards collection; good specimens are also in the British Museum collection.

A. divinula Grt.

1878. Grt., Bull. Geol. Surv., IV, 183, *Annaphila.*

HABITAT.—California.

The type is in the British Museum.

A. germana Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 138, *Annaphila.*

HABITAT.—California.

The type is in the Edwards collection. Mr. Edwards suggested that this might be a variety of *amicula* (*decia*), but though it resembles that species closely it seems to be distinct.

A. decia Grt.*

1875. Grt., Can. Ent., VII, 47, *Annaphila.*
amicula Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 137, *Annaphila.*
1878. Grt., Bull. Geol. Surv., IV, 183, *Annaphila.*

HABITAT.—California.

Mr. Grote's type is in the British Museum; that of Mr. Edwards is in his own collection.

A. depicta Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 150, pl. IV, f. 13, *Annaphila.*

HABITAT.—California.

Types are in the British Museum and in the Edwards collection.

A. salicis Hy. Edw.

1881. Hy. Edw., Papilio, I, 23, *Annaphila.*
arvalis Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VII, 136, *Annaphila.*
1881. Hy. Edw., Papilio, I, 23, *nomen bis lectum.*

HABITAT.—Sierra Nevada, California.

Types are in the Edwards collection, and there is also a specimen marked "type" in the British Museum.

A. lithosina Hy. Edw.

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 137, *Annaphila.*

HABITAT.—California.

The type is in the Edwards collection. This collection by the bye contains type specimens of nearly all the species as Mr. Edwards furnished most of the material from which Mr. Grote described.

A. mera Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 277, *Annaphila.*

HABITAT.—California.

The type is in the British Museum.

A. immerens Harv.

1875. Harv., Can. Ent., VII, 160, *Annaphila*

HABITAT.—California.

The type is in the British Museum.

A. danistica Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 151, pl. IV, f. 7, *Annaphila.*

HABITAT.—Nevada; California.

The type is in the British Museum.

A. pustulata Hy. Edw.

1881. Hy. Edw., Papilio, I, 23, *Annaphila.*

HABITAT.—Arizona.

The type is in the Edwards collection.

A. domina Hy. Edw.

1875. Hy. Edw., Proc. Col. Ac. Sci., VI, 138, *Annaphila.*

HABITAT.—California.

The type is in the Edwards collection.

A. aurantiaca Hy. Edw.*

1881. Hy. Edw., Papilio, I, 23, *Annaphila.*

HABITAT.—California.

The type is in the Edwards collection. It is not an *Annaphila*, but a Heliothid, for which I have not found the best place as yet. There are several small forms in collections as yet undescribed.

Genus **TRICHOTARACHE** Grt.

1875. Grt., Can. Ent., VII, 48.

T. assimilis Grt.

1875. Grt., Can. Ent., VII, 48, *Trichotarache*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 166, *Trichotarache*.

HABITAT.—California.

The type is in the British Museum.

Genus **ACONTIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 91.

A. flavipennis Grt

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 153, *Tarache*.

HABITAT.—Oregon; California; Sierra Nevada.

The type is in the Edwards collection.

A. aprica Hbn.*

1803. Hbn., Schmett. Eur., Noct., f. 371, *Noctua*.
1816. Hbn., Verzeichniss, 261, *Tarache*.
1829. Steph., Ill. Brit. Ent., Haust., III, 113, *Acontia*.
1852. Gn., Spec. Gen., Noct., II, 219, *Acontia*.
1857. Wlk., C. B. Mus., Het., XII, 785, *Acontia*.
1868. H. Sch., Corr.-Blatt, 1868, Cuba, p. 10, *Acontia*.
1874. Morr., Proc. Bost. Soc. Nat. Hist., XVII, 212, *Tarache*.
1885. Gundlach, Cont. Ent. Cuba., 312, *Acontia*.
var. **biplaga** Gn.*
1852. Gn., Spec. Gen., Noct., II, 218, *Acontia*.
1857. Wlk., C. B. Mus., Het., XII, 785, *Acontia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. var.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 36, pr. var.

HABITAT.—Southern States; Texas; Colorado; Missouri in October.

What seems to be a typical specimen, labeled by Guenée, is in the British Museum. Mr. Butler, in the Entomologist, XXV, 63, 1892, cites *Acontia unocula* Freyer, neuere Beitraege, VI, tab. 534, f. 3, as an additional synonym, perhaps correctly. He also, incorrectly, makes *biplaga* the female of *aprica*. Both sexes of both forms are found.

A. abdominalis Grt.

1877. Grt., Can. Ent., IX, 157, *Tarache*.

HABITAT.—Texas, March, May, and September; Kansas in May.

A type is in the British Museum, from the Grote collection; another, from the Meske collection, is in the National Museum.

A. expolita Grt.

1882. Grt., Papilio, II, 131, *Tarache*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

A. lanceolata Grt.

1879. Grt., Can. Ent., XI, 198, *Tarache*.

HABITAT.—Texas.

The type is in the British Museum.

A. angustipennis Grt.*

1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 426, *Tarache*.

HABITAT.—Texas in May; Colorado in August; California; New Mexico.

The type is in the British Museum.

A. sutrix Grt.

1880. Grt., Can. Ent., XII, 154, *Tarache*.

HABITAT.—Colorado; Nevada; New Mexico.

A type is in the British Museum.

A. tenuicola Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 218, *Tarache*.

HABITAT.—Texas in April.

Types are in the Cambridge collection and with Mr. Neumœgen. The species closely approaches some forms of *candefacta*, but lacks all yellow markings.

A. erastroides Gn.*

1852. Gn., Spec. Gen., Noct., II, 218, *Acontia*.
1857. Wlk., C. B. Mus., Het., XII, 784, *Acontia*.
1868. C. & R., Trans. Am. Ent. Soc., II, 78, *Tarache*.
1881. Coquillett, Papilio, I, 8, *larva*.
1883. Coquillett, Papilio, III, 84, *larva*.

HABITAT.—Canada: Eastern and Middle States, June and August.

The type is in the British Museum; others are in the Guenée collection with M. Oberthür.

A. candefacta Hbn.*

1823. Hbn., Zutraege, III, ff. 587, 588, *Tarache*.
1852. Gn., Spec. Gen., Noct., II, 216, *Acontia*.
1857. Wlk., C. B. Mus., Het., XII, 784, *Acontia*.
1880. Grt., Can. Ent., XII, 118, *Tarache*.
1883. Coquillett, Papilio, III, 84, *larva*.
minuta Haw.
1810. Haw., Lep. Britt., 265, *Phytometra*.
1857. Wlk., C. B. Mus., Het., XII, 784, pr. syn.
debilis Wlk.
1857. Wlk., C. B. Mus., Het., XII, 786, *Acontia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.

HABITAT.—United States east of the Rocky Mountains; Colorado; Canada, May, June, and September; Kansas in July; Texas in April and August.

Walker's type is in the British Museum and is the normal form of our common species. In citing *minuta* Haw., in the synonymy, I follow Walker without verification and merely to suggest inquiry. If the reference prove correct, Hübner's name must be superseded.

A. arizonæ Hy. Edw.*

1878. Hy. Edw., Pacific Coast Lep., No. 29, 7, *Thalpochares.*
1880. Grt., Can. Ent., XII, 58, *Thalpochares.*
1882. Grt., New List, 37, *Tarache.*

HABITAT.—Arizona; California.

The types are in the Edwards collection.

A. sedata Hy. Edw.

1881. Hy. Edw., Papilio, I, 23, *Tarache.*

HABITAT.—Arizona.

The type is in the Edwards collection.

A. elegantula Harv.*

1876. Harv., Can. Ent., VIII, 55, *Thalpochares.*
1880. Grt., Can. Ent., XII, 58, *Thalpochares.*
1882. Grt., New List, 37, *Tarache.*
semiopaca Grt.
1878. Grt., Bull. Geol. Surv., IV, 182, *Tarache.*
1882. Grt., New List, 37, pr. syn.
seminivealis Hulst.
1886. Hulst, Trans. Am. Ent. Soc., XIII, 157, *Orobæna.*

HABITAT.—Arizona; Nevada; Montana in June; Colorado.

Dr. Harvey's type is in the Edwards collection; Mr. Grote's type is in the British Museum, while Dr. Hulst's type is now in the Rutgers College collection.

A. binocula Grt.*

1875. Grt., Can. Ent., VII, 224, *Tarache.*
virginalis Grt.
1881. Grt., Can. Ent., XIII, 15, pr. var.
1881. Grt., Papilio, I, 155, ? pr. var.

HABITAT.—Arizona; Texas in May; Kansas in July.

Types of both species are in the British Museum.

A. cretata G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., III, 181, pl. II, p. 78, *Tarache.*

HABITAT.—Texas in August; Colorado.

The type is in the collection of the American Entomological Society.

A. lactipennis Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 10, pl. II, f. 3, *Tarache.*
1875. Harv., Can. Ent., VII, 135, *Tarache.*

HABITAT.—Texas, April to June.

The type is in the British Museum.

A. delecta Wlk.*

1857. Wlk., C. B. Mus., Het., XII, 799, *Acontia.*
1868. G. & R., Trans. Amer. Ent. Soc., II, 78, *Tarache.*
1874. Morr., Proc. Bost. Soc. N. H., XVII, 212, *Tarache.*
1888. Weeks, Ent. Amer., IV, 46, larva.
1892. Beut., Bull. Am. Mus. N. H., IV, 68, larva.
metallica Grt.
1865. Grt., Proc. Ent. Soc. Phil., IV, 327, pl. II, f. 7, *Acontia.*
1868. G. & R., Trans. Am. Ent. Soc., II, 78, pr. syn.

HABITAT.—New Jersey, southward to Florida and Texas (in May). Walker's type is in the British Museum; that of Mr. Grote's is in the Collection of the American Entomological Society. This species is readily known by its large size and color resemblance to *Eudryas.*

A. terminimaculata Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 153, *Tarache.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 162, *Tarache.*

HABITAT.—New York; Massachusetts; Illinois in August.
The type is with Dr. Lintner.

A. ardoris Hbn.

1823. Hbn., Zutræge zur Samml. Ex. Schmett., III, 34, f. 551, 552, *Tarache.*
1852. Gn., Spec. Gen., Noct., II, 219, *Acontia.*
1857. Wlk., C. B. Mus., Het., XII, 758, *Acontia.*
1880. Grt., Can. Ent., XII, 118, *Tarache,* ? an American.

HABITAT.—“Georgia.” ?

In the Museum at Paris is a specimen from South America, identified by Guenée. The species has the maculation of *candefacta,* but is darker in color and narrower winged. I do not remember any similar specimens in American collections.

Genus CHAMYRIS Gn.

1852. Gn., Spec. Gen., Noct., II, 225.

C. cerintha Tr.*

1825. Tr., Schmett. Eur., V, 240, *Acontia.*
1829. Bdv., Ind. Meth., 165, *Acontia.*
1845. H. Sch., Schmett. Eur., II, pl. 86, f. 446, *Acontia.*
1852. Gn., Spec. Gen., Noct., II, 225, *Chamyris.*
1857. Wlk., C. B. Mus., Het., XII, 803, *Chamyris.*
1874. Lint., Ent. Cont., III, 163, *Chamyris.*
1881. Coquillett, Papilio, I, 56, larva on apple.
1892. Edw. & Elliott, Bull. Am. Mus. N. H., IV, 78, larva.

HABITAT.—Canada; Eastern, Middle, Southern, and Central States; New York in May and July; Canada in June; Massachusetts in June and July; Kansas in May.

Erroneously described by Treitschke as a European species.

Genus **AZENIA** Grt.

1882. Grt., Papilio, II, 186.

A. implora Grt.

1882. Grt., Papilio, II, 186, *Azenia*.
1883. Grt., Proc. Am. Phil. Soc., XXI, 166, 175, *Azenia*.
1890. Grt., Ent. Amer., VI, 162, *Azenia*.

HABITAT.—Arizona.

A. edentata Grt.

1883. Grt., Can. Ent., XV, 25, *Azenia*.
1890. Grt., Ent., Amer., VI, 162, *Azenia*.

HABITAT.—Arizona.

Types of both the above species are in the Neumœgen collection.

Genus **ESCARIA** Grt.

1882. Grt., Papilio, II, 186.

E, clauda Grt.*

1882. Grt., Papilio, II, 186, *Escaria*.
1890. Grt., Ent. Amer., VI, 163, *Escaria*.

HABITAT.—Arizona.

Types are in the Neumœgen collection and in the National Museum.

Genus **FRUVA** Grt.

1877. Grt., Can. Ent., IX, 69.

F. fasciatella Grt.*

1875. Grt., Can. Ent., VII, 225, *Spraguеia*.
1879. Grt., Can. Ent., XI, 234, *Fruva*.
obsoleta Grt.
1877. Grt., Can. Ent., IX, 69, *Fruva*.
1879. Grt., Can. Ent., XI, 235, *Fruva*.

HABITAT.—Illinois; Texas; Iowa.

The types of both names are in the British Museum, and both refer to one species. It is merely a question of completeness of maculation and not much difference at that.

F. acerba Hy. Edw.

1881. Hy. Edw., Papilio, I, 24, *Fruva*.

HABITAT.—California.

The type is in the Edwards collection.

F. modesta Hy. Edw.

1884. Hy. Edw., Papilio, IV, 124, *Fruva*.

HABITAT.—Virginia City, Nevada.

The type is in the Edwards collection.

F. apicella Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 21, *Emmelia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Erotyla*.
1879. Grt., Can. Ent., XI, 237, *Spragueia*.

1882. Grt., New List, 38, *Fruva.*
♀ *truncatella* Zell.
1873. Zell, Verh. k. k. zoöl. bot. Ges., XXIII, 3, t. 3, f. 1, *Agrophila.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 199, pr. syn.
♂ ♀ *accepta* Hy. Edw.
1881. Hy. Edw., Papilio, I, 24, *Fruva.*
1882. Grt., New List, 38, pr. syn.

HABITAT.—Southern States; Texas.

The Grote type is in the collection of the American Entomological Society; Mr. Edwards's types are in his collection; the Zeller type is in the Cambridge collection.

F. parvula Wlk.

1865. Wlk., C. B. Mus., Het., XXXIII, 779, *Xanthodes.*
georgica Grt.
1881. Grt., Can. Ent., XIII, 232, *Fruva.*

HABITAT.—Arizona.

Both the types are in the British Museum, and unquestionably refer to the same species. Walker's species is from "locality unknown."

F. deleta Hy. Edw.

1884. Hy. Edw., Papilio, IV, 124, *Fruva.*

HABITAT.—Virginia City, Nevada; Hudson's Bay Territory.

Types are in the Edwards and Neumœgen collections.

Genus XANTHOPTERA Gn.

1852. Gn., Spec. Gen., Noct., II, 240.

X. nigrofimbria Gn.*

1852. Gn., Spec. Gen., Noct., II, 241, pl. 10, f. 12, *Xanthoptera.*
1857. Wlk., C. B. Mus., Het., XII, 819, *Xanthoptera.*
1879. Grt., Can. Ent., XI, 235, *Xanthoptera.*

HABITAT.—New York to Texas; Central States; Missouri and Texas in August; District of Columbia in June.

The type is probably with M. Oberthür at Rennes.

X. clausula Grt.

1882. Grt., Papilio, II, 186, *Xanthoptera.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

X. semiflava Gn.*

1852. Gn., Spec. Gen., Noct., II, 241, *Xanthoptera.*
1857. Wlk., C. B. Mus., Het., XII, 818, *Xanthoptera.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 221, *Prothymia.*
1879. Grt., Can. Ent., XI, 235, *Xanthoptera.*

HABITAT.—Southern States; Texas.

The type is probably at Rennes with M. Oberthür; a specimen, apparently labeled by Guenée, is in the British Museum.

X. subcitrinalis Hulst.

1886. Hulst, Trans. Am. Ent. Soc., XIII, 157, *Orobœna*.
1891. Smith, List Lepidoptera, 56, *Xanthoptera*.

HABITAT.—Arizona.

The type is in the Rutgers College collection. From superficial characters the species belongs here. I have not tried to compare it with described forms; but it is none of those represented in the British Museum.

Genus SPRAGUEIA Grt.

1875. Grt., Check List Noctuidæ, 25.

S. onagrus Gn.*

1852. Gn., Spec. Gen., Noct., II, 205, pl. x, f. 2, *Agrophila*.
1857. Wlk., C. B. Mus., Het., XII, 774, *Agrophila*.
1858. H. Sch. Lep. Ex., f. 209, *Agrophila*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, an var. *leo*; *Erotyla*.
1879. Grt., Can. Ent., XI, 232, an spec. dist.

HABITAT.—Southern States; Florida; Texas.

The type is in the Boisduval collection, now with M. Oberthür, at Rennes. In the British Museum there is a specimen apparently named by Guenée, but not the type. It is like the species labeled *onagrus* in our collections.

S. leo Gn.*

1852. Gn., Spec. Gen., Noct., II, 205, *Agrophila*.
1857. Wlk., C. B. Mus., Het., XII, 773, *Agrophila*.
1879. Grt., Can. Ent., XI, 231, *Spragueia*.

HABITAT.—With the preceding.

The type is also from the Boisduval collection now with M. Oberthür. In the British Museum there is a specimen apparently labeled by Guenée, and this is undoubtedly a variety of the preceding. Mr. Grote cites Herrich-Schæffer's figure of *onagrus* in error to this species; but I am not sure if he is correct. At all events further study is required to settle the matter.

S. magnifica Grt.

1882. Grt., Papilio, II, 183, *Spragueia*.

HABITAT.—Arizona.

The type is in Mr. Neumœgen's collection.

S. plumbifimbriata Grt.*

1877. Grt., Can. Ent., IX, 68, *Spragueia*.
1879. Grt., Can. Ent., XI, 233, *Spragueia*.

HABITAT.—Texas in April, May, and July.

The type is in the British Museum.

S. obatra Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 124, *Taracho.*
1880. Grt., Can. Ent., XII, 186, *Spragueia.*

HABITAT.—Southern States; Louisiana.

The type is in the Tepper collection.

S. dama Gn.*

1852. Gn., Spec. Gen., Noct., II, 205, *Agrophila.*
1857. Wlk., C. B. Mus., Het., XII, 773, *Agrophila.*
1868. H. Sch., Corr. Blatt, 1868, Cuba, 11, *Emmelia.*
1879. Grt., Can. Ent., XI, 233, *Spragueia.*
1885. Gundlach, Cont. Ent. Cub., 313, *Emmelia.*
trifariana Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 777, *Agrophila.*

HABITAT.—Southern States; Florida; Texas; Cuba.

Guenée's type is with M. Oberthür. Walker's type is in the British Museum and is like the specimens named *dama* in the Grote collection. I believe Mr. Grote's identification to be correct, and therefore cite Mr. Walker's species in the synonymy; it is from "locality unknown."

S. transmutata Wlk.

1865. Wlk., C. B. Mus., Het., XXXIII, 776, *Agrophila.*
pardalis Grt.
1881. Grt., Papilio, I, 50, *Spragueia.*

HABITAT.—Florida; St. Domingo.

Both the Grote and Walker types are in the British Museum, and they undoubtedly refer to the same species.

S. funeralis Grt.*

1881. Grt., Papilio, I, 158, *Spragueia.*
1882. Grt., Ill. Essay, 61, pl. 3, f. 30, *Spragueia.*

HABITAT.—Arizona.

Types are in the British Museum and in the National Museum.

S. sordida Grt.*

1882. Grt., Can. Ent., XIV, 217, *Spragueia.*

HABITAT.—Texas.

The type, given me by Mr. Grote, is now in the National Museum.

S. guttata Grt.*

1875. Grt., Can. Ent., VII, 224, *Spragueia.*
1879. Grt., Can. Ent., XI, 234, *Spragueia.*

HABITAT.—Texas.

The type is in the British Museum.

S. tortricina Zell.*

1872. Zell., Ver. k. k. Zoöl. bot. Ges., XXII, 461, pl. II, f. 5, *Agrophila*.
1879. Grt., Can. Ent., XI, 233, *Spragueia*.
inorata Grt.
1882. Grt., Papilio, II, 183, *Spragueia*.
1891. Smith, List Lepid., 56, pr. syn.

HABITAT.—Texas in March and May; Kansas in July.

Zeller's type is in the Museum at Cambridge; Mr. Grote's type is in the Neumœgen collection. The two are the same, specifically. By an unfortunate oversight the synonymy in my list is reversed and *tortricina* stands as a synonym of *inorata* instead of *vice versa*.

Genus **EXYRA** Grt.

1875. Grt., Check List Noct., 26.

E. semicrocea Gn.*

1852. Gn., Spec. Gen., Noct., II, 241, *Xanthoptera*.
1857. Wlk., C. B. Mus., Het., XII, 818, *Xanthoptera*.
1874. Riley, Can. Ent., VI, 208, figs.; life history.
1874. Riley, Trans. St. L. Ac. Sci., III, 236, fig.; life hist.
1879. Grt., Can. Ent., XI, 236, *Exyra*.

HABITAT.—Middle, Central, and Southern States.

The name has no type, since Guenée described from a figure by Abbot, and had no autoptic acquaintance with the insect. There is no reasonable doubt however of the identification.

E. ridingsii Riley.*

1874. Riley, Trans. St. Louis Ac. Sci., III, 240, *Xanthoptera*.
1879. Grt. Can. Ent., XI, 236, *Exyra*.
nigrocaput Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 153, *Xanthoptera*.
1875. Grt., Can. Ent., VII, 17, pr. syn.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 211, pr. syn.

HABITAT.—Central and Southern States; Texas.

Dr. Riley's type is in the National Museum. I do not know where Mr. Morrison's type now is.

E. fax Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 295, *Xanthoptera*.
1879. Grt., Can. Ent., XI, 236, *Exyra*.

HABITAT.—Southern States; Delaware in September.

I do not know where the type is at present.

E. rolandiana Grt.*

1877. Grt., Psyche, II, 38, *Exyra*.
1877. Thaxter, Psyche, II, 39, larva.
1882. Grt., Ill. Essay, 64, pl. 3, f. 35, *Exyra*.

HABITAT.—Massachusetts, May and June; Eastern, Middle, and Central States.

The type is in the British Museum.

Genus **PROTHYMIA** Hbn.

1816. Hbn., Verzeichniss, 282.
1890. Grt., Ent. Amer., vi, 163.

P. rhodarialis Wlk.*

1859. Wlk., C. B. Mus., Het., xix, 860, *Herminia*.
1865. Wlk., C. B. Mus., Het., xxxiv, 1204, *Marimatha*.
coccineifascia Grt.
1873. Grt., Trans. Am. Ent. Soc., iv, 294, pl. i, f. 89, *Xanthoptera*.
1874. Morr., Proc. Bost. Soc. N. H., xvii, 154, *Prothymia*.
1879. Grt., Can. Ent., xi, 236, *Prothymia*.
1883. Grt., Proc. Am. Phil. Soc., xxi, 167, *Prothymia*.

HABITAT.—Massachusetts to Texas; Florida in March; Texas, May to August.

Both the types are in the British Museum and refer to one species only. Walker's specimens are from "locality unknown."

P. semipurpurea Wlk.*

1865. Wlk., C. B. Mus., Het., xxxiii, 803, *Anthophila*.
confinisalis Wlk.
1865. Wlk., C. B. Mus., Het., xxxiv, 1206, *Marimatha*.
rosalba Grt.
1873. Grt., Trans. Am. Ent. Soc., iv, 295, pl. i, f. 88, *Xanthoptera*.
1874. Morr., Proc. Bost. Soc. Nat. Hist., xvii, 154, *Prothymia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 22, *Prothymia*.
1879. Grt., Can. Ent., xi, 238, *Prothymia*.

HABITAT.—Massachusetts in May, to Texas in June and July; Central States.

The types are all in the British Museum, and all refer to one species. Mr. Walker's material is all from "locality unknown."

P. plana Grt.

1882. Grt., Papilio, ii, 184, *Prothymia*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

P. orgyiæ Grt.*

1875. Grt., Trans. Am. Ent. Soc., v, 116, *Prothymia*.
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 311, *Prothymia*.
1879. Grt., Can. Ent., xi, 236, *Prothymia*.
subolivacea, Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., iii, 11, *Prothymia*.
1879. Grt., Can. Ent., xi, 236, pr. syn.

HABITAT.—Texas in March, May, July, and September.

Both the types are in the British Museum and refer to one species only.

Genus **METATHORASA** Moore.

1881. Moore, Proc. Zool. Soc., 374.

M. argentilinea Wlk.

1857. Wlk., C. B. Mus., Het., XII, 863, *Callopistria*.
1882. Grt., New List, 38, *Herrichia*.
1882. Grt., Papilio, II, 122, *Euherrichia*.
1891. Butler, Ann. Mag. Nat. Hist., 1891, 72, *Metathorasa*.

HABITAT.—Middle, Southern, and Central States.

The type is in the British Museum.

M. monetifera Gn.*

1852. Gn., Spec. Gen., Noct., II, 295, pl. XIV, f. 4, *Eriopus*.
1857. Wlk., C. B. Mus., Het., XII, 863, *Callopistria*.
1882. Grt., New List, 38, *Herrichia*.
1882. Grt., Papilio, II, 122, *Euherrichia*.
1890. Grt., Ent. Amer., VI, 163, *Euherrichia*.
1891. Butler, Ann. Mag. Nat. Hist., 1891, 73, *Metathorasa*.

HABITAT.—Nova Scotia; Canada; Northern, Eastern, and Southern States; New York in June and July; New Jersey; Florida.

The species was described from the Saunders collection, and the type is probably at Oxford.

Genus **EUHERRICHIA** Grt.

1882. Grt., Papilio, II, 122.
1890. Grt., Ent. Amer., VI, 163.

E. mollissima Gn.*

1852. Gn., Spec. Gen., Noct., II, 294, *Eriopus*.
1857. Wlk., C. B. Mus., Het., XII, 863, *Callopistria*.
1882. Grt., New List, 38, *Herrichia*.
1882. Grt., Papilio, II, 122, *Euherrichia*.
1891. Butler, Ann. Mag. Nat. Hist., 1891, 73, *Haploolophus*.
  rubicunda Wlk.
1857. Wlk., C. B. Mus., Het., XII, 808, *Erastria*.
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.

HABITAT.—Canada to Florida; Colorado, June and August.

The types of both names are in the British Museum and have been correctly united by Messrs. Grote and Robinson.

E. granitosa Gn.*

1852. Gn., Spec. Gen., Noct., II, 295, *Eriopus*.
1857. Wlk., C. B. Mus., Het., XII, 863, *Callopistria*.
1875. Grt., Proc. Bost. Soc. N. H., XVIII, 415, *Eriopus*.
1882. Grt., New List, 38, *Herrichia*.
1882. Grt., Papilio, II, 122, *Euherrichia*.

HABITAT.—Southern States; Florida.

The type is in the Boisduval collection with M. Oberthür.

E. cervina Hy. Edw.

1890. Hy. Edw., Ent. Amer., VI, 114, *Herrichia*.

HABITAT.—Mount Shasta district, California; Colorado.

Genus **CALLOPISTRIA** Hbn.

1816. Hbn., Verzeichniss, 216.

C. **floridensis** Gn.

1852. Gn., Spec. Gen., Noct., II, 192, *Eriopus*.
1857. Wlk., C. B. Mus., Het., XII, 862, *Callopistria*.
1882. Grt., Papilio, II, 122, *Euherrichia*.
1891. Butler, Ann. Mag. Nat. Hist., 1891, 75, *Callopistria*.

HABITAT.—Florida.

The type is in the British Museum.

C. **strena** Grt.

In Ent. Amer., VI, 164, 1890, Mr. Grote speaks of this species as "described," but without saying where. I have been unable to find any description or any reference in the Record or Yahresbericht. Yet I may have overlooked it, and cite the species with the explanation and no references. The types are with Mr. Neumœgen.

Genus **LITHACODIA** Hbn.

1816. Hbn., Verzeichniss, 205.

L. **bellicula** Hbn.*

1818. Hbn., Zutraege zur Samml, Ex. Schmett., 18, f. 85, 86, *Lithacodia*.
1857. Wlk., C. B. Mus., Het., XI, 583, *Hadena*.
1880. Grt., Can. Ent., XII, 86, *Lithacodia*.
semichalcea Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 797, *Hydrelia*.
1892. Butler, Entomologist, XXV, 65, pr. syn.

HABITAT.—Nova Scotia to Florida and Texas; Central States, June to August; Colorado.

Walker's type is in the British Museum and is the well-known Hübnerian species.

Genus **ERASTRIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 92.

Eustrotia Hbn., bears date the same year, but was certainly not published until 1818 at least. Mr. Grote gives an enumeration of some of the species, Ent. Amer., VI, 164, 1890.

E. **malaca** Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 296, *Erastria*.
1881. Grt., Papilio, I, 11, *Eustrotia*.

HABITAT.—Pennsylvania.

The type is in the British Museum. It has no head, no legs, and only half a thorax. It seems a good species, however, which I had not before seen.

E. **albidula** Gn.*

1852. Gn., Spec. Gen., Noct., II, 230, *Erastria*.
1857. Wlk., C. B. Mus., Het., XII, 807, *Erastria*.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Eustrotia*.
intractabilis Wlk.
1860. Wlk., Can. Nat. and Geol., V, 252, *Nonagria*.
1877. Grt., Can. Ent., IX, 28, pr. syn.

HABITAT.—Middle and Central States, June and July.

Guenee's type should be in the British Museum, but I did not see it there. Walker's type is in the collection of the Entomological Society of Ontario and was examined by Mr. Grote, who gives the above reference.

E. secta Grt.

1879. Grt., Can. Ent., XI, 199, *Eustrotia*.
1880. Grt., Can. Ent., XII, 50, *Eustrotia*.

HABITAT.—Massachusetts.

The type is with Dr. Thaxter.

E. flaviguttata Grt.

1882. Grt., Can. Ent., XIV, 187, *Eustrotia*.

HABITAT.—Texas.

Described by Mr. Grote from his own collection. The type is with Mr. Neumœgen.

E. concinnimacula Gn.*

1852. Gn., Spec. Gen., Noct., II, 238, pl. x, f. 10, *Leptosia*.
1857. Wlk., C. B. Mus., Het., XII, 816, *Leptosia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 36, *Thalpochares*.
1882. Grt., New List, 37, *Eustrotia*.
var. **parvimacula** Grt.
1880. Grt., North Amer. Ent., I, 66, *Eustrotia*.

HABITAT.—Canada to Texas; west to the Rocky Mountains; Texas in March; Canada and New York, May, June, and July.

The types are in the British Museum.

E. synochites G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 357, *Erastria*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Eustrotia*.

HABITAT.—Canada in June, to Texas; Central States, May to August.

A specimen labeled *synochitis* Grt., type, is in the British Museum. In the same collection is also a specimen of the same species labeled *Erastria viridata* Wlk., but I can not find any description of such a species.

E. olivula Gn.

1852. Gn., Spec. Gen., Noct., II, 231, pl. x, f 8, *Bankia*.
1857. Wlk., C. B. Mus., Het., XII, 811, *Bankia*.
1890. Grt., Ent. Amer., VI, 164, *Eustrotia*.

HABITAT.—"North America."

The type is in M. Oberthür's collection. I am not aware that this species has been identified in American collections. It is a very distinctly marked form from the figure, and there should be no difficulty in recognizing it. Mr. Grote suggests that this may possibly be *synochitis*, but this can scarcely be so from the figure.

E. musta G. & R.*

1868. G. & R., Trans. Am. Ent. Soc., I, 358, *Erastria.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Eustrotia.*

HABITAT.—Eastern, Middle, and Central States; Missouri in May; Texas in August.

The type is in the collection of the American Entomological Society.

E. muscosula Gn.*

1852. Gn., Spec. Gen., Noct., II, 230, *Erastria.*
1857. Wlk., C. B. Mus., Het., XII, 807, *Erastria.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Eustrotia.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 159, *Erastria.*

HABITAT.—Eastern, Middle, and Central States; Canada and New York, June and July; District of Columbia, June and August.

The type is in the British Museum.

E. retis Grt.

1879. Grt., Can. Ent., XI, 198, *Eustrotia.*

HABITAT.—Pennsylvania.

The type is in the British Museum and is rather closely related to *caduca.*

E. distincta Grt.

1882. Grt., Papilio, II, 184, *Eustrotia.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

E. caduca Grt.

1876. Grt., Can. Ent., VIII, 207, *Eustrotia.*

HABITAT.—Canada; New York; New Jersey in July.

The type is in the British Museum.

E. propera Grt.

1882. Grt., Papilio, II, 132 et 184, *Eustrotia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

E. apicosa Haw.*

1812. Haworth, Lep. Britt., 261, *Phytometra.*
1829. Steph., Ill. Brit. Ent., Haust., III, 119, *Erastria.*
1835. Wood, Index Ent., 74, pl. 17, f. 464, *Erastria.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II. 199, *Eustrotia.*
nigritula Gn.
1852. Gn., Spec. Gen., Noct., II, 229, pl. X, f. 7, *Erastria.*
1857. Wlk., C. B. Mus., Het., XII, 807, *Erastria.*

1868. H. Sch., Corr.-Blatt, 1868, Cuba, 12, *Erastria.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, pr. syn.
1885. Gundlach, Cont. Ent. Cub., 315, *Erastria.*
undulifera Wlk.
1856. Wlk., C. B. Mus., Het., IX, 258, *Miana.*
1868. G. & R., Trans. Am. Ent. Soc., II, 78, = *nigritula.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, pr. syn.

HABITAT.—Canada to Florida; Cuba; Central States, June to September.

The Walker and Guenée types are in the British Museum and are one species as referred by Mr. Grote.

E. carneola Gn.*

1852. Gn., Spec. Gen., Noct., II, 228, *Erastria.*
1857. Wlk., C. B. Mus., Het., XII, 807, *Erastria.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 37, *Eustrotia.*
1881. Coquillett, Papilio, I, 7, larva.
1882. Coquillett, Papilio, II, 57, life history.
biplaga Wlk.
1857. Wlk., C. B. Mus., Het., XII, 809, *Erastria.*
1858. Wlk., C. B. Mus., Het., XIV, 1761, pr. syn.

HABITAT.—Canada; United States east of the Rocky Mountains, May to September.

The types are in the British Museum.

E. dividua Grt.

1880. Grt., North Am. Ent., I, 46, *Eustrotia.*

HABITAT.—Texas.

The type is in the British Museum.

E. aeria Grt.*

1881. Grt., Papilio, I, 11, *Eustrotia.*

HABITAT.—Wisconsin; Alabama.

The type is in the British Museum.

E. includens Wlk.*

1857. Wlk., C. B. Mus., Het., XII, 813, *Hydrelia.*
norma Morr.
1875. Morr., Can. Ent., VII, 216, *Hadena.*
1880. Grt., Can. Ent., VII, 186, = *mariæ.*
penita Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 71, *Lithacodia.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 39, = *norma.*
1880. Grt., Can. Ent., XII, 186, = *mariæ.*
mariæ Grt.
1877. Grt., Can. Ent., IX, 67, *Eustrotia.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 39, = *norma.*

HABITAT.—Nova Scotia; Canada; Eastern and Middle States.

The Walker and Grote types are in the British Museum; the type of *penita* is in the Tepper collection; that of *norma* I have not seen. Mr.

Grote persistently used his name for this species, though both of Mr. Morrison's names antedate it by two years. The Walker name will probably have enough priority to secure recognition.

Eustrotia obaurata Morr., and *Erastria pustulata* are both = *Argyrophyes nigrofasciata* Zell. The other species erroneously described as *Erastria* will be found elsewhere referred to.

Genus **THALPOCHARES** Led.

1853. Led., Verh. k. k. zoöl. bot. Ges., 1853.
1857. Lederer, Noct. Europas, 184.

T. ætheria Grt.

1879. Grt., No. Amer. Ent., I, 47, *Thalpochares.*
1880. Grt., Can. Ent., XII, 59, *Thalpochares.*

HABITAT.—Florida.

Mr. Grote's type is in the British Museum.

T. flammicincta Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 801, *Anthophila.*
patula Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 69, *Tarache.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Thalpochares.*
1880. Grt., Can. Ent., XII, 57, *Thalpochares.*
patruelis Grt.
1876. Grt., Can. Ent., VIII, 27, *Tarache.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, pr. syn.
1880. Grt., Can. Ent., XII, 57, *Thalpochares.*
1892. Butler, Entomologist, XXV, 189, *Eumestleta.*

HABITAT.—Texas, October and November; San Domingo.

Mr. Morrison's type is in the Tepper collection; Mr. Grote's is in the British Museum. Mr. Butler has made this species the type of a new genus, *Eumestleta;* with what justice, I am not prepared to say. The fact that I do not use the genus here indicates only that it was published so late that the addition referring to it was made in proof. I did not see the type of *Anthophila flammicincta* at the British Museum; but the species is so well marked that I have no hesitation in accepting Mr. Butler's determination. He suggests that the species may be Deltoid!

T. carmelita Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 434, *Thalpochares.*

HABITAT.—Texas; Mississippi; California.

The type is in the Tepper collection.

T. mundula Zell.*

1872. Zell., Verh. k. k. zoöl. bot. Ges., XXII, 460, pl. 2, f. 4, *Thalpochares.*

HABITAT.—Texas, May and June.

The type is in the Museum at Cambridge. It is a curious species, strongly resembling *Pleonectyptera* in appearance and in maculation.

T. orba Grt.

1877. Grt., Can. Ent., IX, 68, *Thalpochares.*

HABITAT.—Alabama.

The type is in the British Museum.

T. fortunata Grt.

1882. Grt., Can. Ent., XIV, 171, *Thalpochares.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

T. perita Grt.

1882. Grt., Can. Ent., XIV, 171, *Thalpochares.*

HABITAT.—Arizona.

A type is in the British Museum; another with Mr. Neumœgen.

Genus GALGULA Gn.

1852. Gn., Spec. Gen., Noct., II, 239.

G. hepara Gn.*

1852. Gn., Spec. Gen., Noct., II, 239, pl. X, f. 11, *Galgula.*
1857. Wlk., C. B. Mus., Het., XII, 817, *Galgula.*
externa Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 985, *Euclidia.*
var. **partita** Gn.*
1852. Gn., Spec. Gen., Noct., II, 239, *Galgula.*
1852. Gn., Spec. Gen., Noct., III, 399, *Galgula subpartita.*
1857. Wlk., C. B. Mus., Het., XII, 817, *Galgula partita.*
vesca Morr.
1875. Morr., Ann. Lyc. Nat. Hist., N. Y., XI, 103 *Telesilla.*
1876. Grt., Can. Ent., VIII, 26, pr. syn.
1876. Grt., Stett. Ent. Zeit., XXXVII, 137, pr. syn.

HABITAT.—Canada, in September. United States: New York, July and August; Massachusetts, in November; Texas, in March; California, in November.

The type of *hepara* is with M. Oberthür; that of *subpartita* and *externa* are in the British Museum, while that of *vesca* is in the Tepper collection. Guenée originally used the term *partita*, but under his own rules changed it to *subpartita* in the index.

Genus TRIPUDIA Grt.

1877. Grt., Can. Ent., IX, 70.

T. flavofasciata Grt.

1877. Grt., Can. Ent., IX, 70, *Tripudia.*
versutus Hy. Edw.
1881. Hy. Edw., Papilio, I, 116, *Oribates.*
1882. Grt., Bull. Geol. Surv., VI, 563, pr. syn.
1882. Grt., Can. Ent., XIV, 33, pr. syn.

HABITAT.—Alabama; Texas; New Mexico; Colorado.

Mr. Grote's type is in the British Museum; that of *versutus* is in the Neumœgen collection.

T. quadrifera Zell.*

1874. Zell., Verh. k.-k. zoöl. bot. Ges., XXIV, pl. XII, f. 2, *Erastria.*
1877. Grt., Can. Ent., IX, 79, *Tripudia.*

HABITAT.—Mexico; Texas; Missouri.

I have not seen the type, nor do I know where it is at present. I have Zeller's paper only in the separate form, in which the description is on p. 3.

T. opipara Hy. Edw.*

1881. Hy. Edw., Papilio, I, 117, *Gyros.*
1882. Grt., New List, 37, *Tripudia.*

HABITAT.—Texas in May.

The type is in Mr. Graef's collection.

T. limbata Hy. Edw.*

1881. Hy. Edw., Papilio, I, 22, *Oribates.*
1882. Grt., New List, 37, *Tripudia.*

HABITAT.—Mazatlan, Mexico; Texas.

The type is in the Edwards collection.

T. basicinerea Grt.

1882. Grt., Bull. Geol. Surv., VI, 563, *Tripudia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

T. lixiva Grt.

1882. Grt., Can. Ent., XIV, 173, *Tripudia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **GYROS** Hy. Edw.

1881. Hy. Edw., Papilio, I, 117.

G. muirii Hy. Edw.

1881. Hy. Edw., Papilio, I, 22, *Oribates;* id., 117, *Gyros.*

HABITAT.—California.

The type is in the Edwards collection.

Lepidomys irrenosa Gn., II, 202, pl. X, f. 1, is usually placed here, but is certainly not North American. The type is in the British Museum. M. Guenée gave New York as the locality; but nothing on the specimen itself nor in the record indicates where it really came from; it has the Doubleday label and that is all. The insect itself is very peculiar; it has a thick truncated tuft of hair at the base of primaries; the palpi like *Pleonectyptera* and altogether it has the look of a tropical species. I do not believe for an instant that it came from New York, and prefer to drop it from our lists as not of our fauna, until the contrary is proved by new specimens.

for *erechtea*. An examination of Cramer's work proved that he was correct, and that the figure referred to the form named *Tæniocampa vegeta* by Mr. Morrison. A very closely allied form has been described in *Synedoida* by Mr. Grote, and it is not improbable that Mr. Edwards' genus may have to give place to Walker's *Cissusa*.

Mr. Slingerland's work has not yet appeared at date of writing, hence could not be specifically referred to.

D. cærulea Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., 155, *Drasteria*.
aquamarina Feld.
1874. Feld., Reise der Nov., Zoöl., II, pt. 2, pl. 117, f. 10, *Euclidia*.
1875. Feld., loc. cit., addenda, =*plumbeola* Grt.

HABITAT.—California.

Mr. Grote's type is in the British Museum. Felder's plates bear date in 1873, but were not issued until late in 1874. He makes a curious error in referring his species to the synonomy, using the name *plumbeola* Grt., and correctly referring to the description of *cærulea*.

Genus **CÆNURGIA** Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1491.

C. convalescens Gn.*

1852. Gn., Spec. Gen., Noct., III, 289, *Drasteria*.
1858. Wlk., C. B. Mus., Het., XIV, 1456, *Drasteria*.
1869. H. Sch., Corr. Blatt, 1869, Cuba, 26, *Drasteria*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 154, *Drasteria*.
1875. Grt., Can. Ent., VII, 49, *Litosea*.
1885. Gundlach, Cont. Ent. Cuba., 350, *Drasteria*.
socors Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1492, *Cænurgia*.
purgata Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1491, *Cænurgia*.

HABITAT.—Canada to Florida; Central States. Walker's types are in the British Museum. Guenée had several specimens before him when he described; but whether the British Museum specimens were of the types I cannot find. Mr. Walker's genus has priority over *Litosea*.

C. adversa Grt.*

1875. Grt., Can. Ent. VII, 49, *Litosea*.

HABITAT.—California.

The type is in the British Museum.

Genus **HYPOCALA** Gn.

1852. Gn., Spec. Gen., Noct., III, 73.

H. hillii Lint.*

1878. Lint., Ent. Cont., IV, 103, *Hypocala*.

HABITAT.—New York, October; Texas, September; Florida in June.

The type is in the Hill collection; a second specimen, before the author when he wrote, is in the National Museum.

Genus **EUCLIDIA** Ochs.

1816. Ochs., Schmett. Eur., IV, 96.

E. cuspidea Hbn.

1818. Hbn., Zutræge, I, 16, ff. 69–70, *Drasteria*.
1816. Hbn., Verzeichniss, 280, *Drasteria*.
1852. Gn., Spec. Gen., Noct., III, 292, *Euclidia*.
1857. Wlk., C. B. Mus., Het., XIV, 1460, *Euclidia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 154, *Euclidia*.
1880. Grt., Can. Ent., XII, 86, *Euclidia*.

HABITAT.—Canada; Northern, Eastern, Middle, and Central States, May to August.

E. intercalaris Grt.

1882. Grt., Bull. Geol. Surv., VI, 563, *Euclidia*.

HABITAT.—New Mexico.

I have seen the type, which was described from Prof. Snow's collection, in the British Museum.

E. annexa Hy. Edw.

1890. Hy. Edw., Ento. Amer., VI, 115, *Euclidia*.

HABITAT.—Rouge River, Oregon.

The types are in the British Museum.

Genus **GRAMMODES** Gn.

1852. Gn., Spec. Gen., Noct., III, 275.

G. smithii Gn.

1852. Gn., Spec. Gen., Noct., III, 266, pl. XXII, f. 4, *Ophiusa*.
1858. Wlk., C. B. Mus., Het., XIV, 1420, *Ophiusa*.
1882. Grt., New List, 39, *Grammodes*.

HABITAT.—Southern States.

G. similis Bdv.

1852. Gn., Spec. Gen., Noct., III, 267, *Ophiusa*.
1858. Wlk., C. B. Mus., Het., XIV, 1420, *Ophiusa*.
1882. Grt., New List, 39, *Grammodes*.
var **apicalis** Bdv.
1852. Gn., Spec. Gen., Noct., III, 267, pr. var.

HABITAT.—Georgia; Southern States.

G. consobrina Gn.

1852. Gn., Spec. Gen., Noct., III, 268, *Ophiusa*.
1857. Wlk., C. B. Mus., Het., XIV, 1420, *Ophiusa*.
1882. Grt., New List, 39, *Grammodes*.

HABITAT.—Southern States.

The types of all these species are with M. Oberthür. The *Ophiusa similis* Wlk.,—whether of Boisduval I cannot say—is rather a *Poaphila* and is new to me. No specimens of it were in the Grote collection. I do not know the type of *Grammodes* and can not say whether the American species are correctly referred. Guenée considered neither of them referable to his genus.

Genus **PANULA** Gn.

1852. Gn., Spec. Gen., Het., III, 59.

P. inconstans Gn.*

1852. Gn., Spec. Gen., Noct., III, 59, pl. XIII, f. 9, *Panula.*
1857. Wlk., C. B. Mus., Het., XIII, 1144, *Panula.*

HABITAT.—Southern States; Texas.

A type is in the British Museum. Guenée describes it from "Coll. div.," and had a number of specimens, showing quite a range of variation, before him.

P. remigipila Gn.

1852. Gn., Spec. Gen., Noct., III, 60, *Panula.*
1857. Wlk., C. B. Mus., Het., XIII, 1144, *Panula.*

HABITAT.—East Florida.

The type is in the British Museum. It is rather a curious species, of the uniform *Tæniocampa* red-brown; but with the typical Synedoid median lines pale marked. It strongly resembles some of the species of *Synedoida*. *Tæniocampa vegeta* Morr., must be compared with this species, and here also *Cissusa spadix* must be referred to as probably congeneric.

Genus **CISSUSA** Wlk.

1856. Wlk., C. B. Mus., Het., IX, 153.

C. spadix Cram.

1780. Cram., Pap. Exot., III, 149, pl. 275, f. F, *Phalæna.*
1856. Wlk., C. B. Mus., Het., IX, 153, *Cissusa.*
1873 Grt., Bull. Buff. Soc. Nat. Sci., I, 155,=*D. erechtea.*
vegeta Morr.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 432, *Tæniocampa.*

HABITAT.—Texas; Southwestern United States.

I have already spoken of this species, which has been long overlooked, and which has been almost certainly described at least twice more than I have indicated. *Cissusa* was described from Cramer's picture of the species; but may have to replace *Synedoida.*

Genus **SYNEDOIDA** Hy. Edw.

1878. Hy. Edw., Proc. Cal. Ac. Sci., Pacific Coast Lep., No. 29, 9.

The above paper was published as a separate only. The species of this genus are ill associated, and there are too many of them. Mr. Edwards had himself intended to unite some of the forms, as larger material proved them identical.

S. cervina Hy. Edw.

1882. Hy. Edw., Papilio, II, 129, *Synedoida.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

S. inepta Hy. Edw.*

1881. Hy. Edw., Papilio, I, 27, *Synedoida.*
morbosa Hy. Edw.
1881. Hy. Edw., Papilio, I, 27, *Synedoida.*

HABITAT.—Colorado.

Types of both forms are in the Neumœgen collection. Mr. Edwards has admitted the identity of the two for some time.

S. biformata Hy. Edw.*

1878. Hy. Edw., Pacific Coast Lep., No. 29, 9, *Synedoida.*

HABITAT.—California.

The types are in the Edwards collection.

S. scrupulosa Hy. Edw.

1878. Hy. Edw., Pacific Coast Lep., No. 29, 9, *Synedoida.*

HABITAT.—California; Colorado.

The types are in the Edwards and Neumœgen collections.

S. insperata Grt.

1882. Grt., Can. Ent., XIV, 176, *Synedoida.*

HABITAT.—Arizona.

This type is in the Neumœgen collection.

S. mucronata Grt.

1883. Grt., Can. Ent., XV, 121, *Synedoida.*

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

S. ægrotata Hy. Edw.

1884. Hy. Edw., Papilio, IV, 47, *Synedoida.*

HABITAT.—Arizona.

The types are with Mr. Neumœgen. Mr. Neumœgen thinks it is the female of *Melipotis perlæta* Edw.

S. valens Hy. Edw.*

1881. Hy. Edw., Papilio, I, 119, *Synedoida.*

HABITAT.—Utah; Colorado in September.

The type is with Mr. Neumœgen.

S. sabulosa Hy. Edw.

1881. Hy. Edw., Papilio, I, 26, *Synedoida.*
1882. Grt., Ill. Essay, 66, pl. IV, f., 39, *Synedoida.*

HABITAT.—Colorado.

The types are in the Neumœgen collection.

Genus **LITOCALA** Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 3.

L. sexsignata Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 280, *Lita.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 3, *Litocala.*
var **deserta** Hy. Edw.
1881. Hy. Edw., Papilio, I, 25, pr. var.

HABITAT.—Nevada; Colorado; Arizona; New Mexico; California in June.

The type of Dr. Harvey's species is in the British Museum; that of *deserta* is in the Edwards collection.

Genus **SYNEDA** Gn.

1852. Gn., Spec. Gen., Noct., III, 71.

With this genus begins a series of forms similar in appearance and habitus, and leading to *Catocala*. There are numerous species described, and very few collections have more than a fair percentage of them. In some of the genera the range of variation is very great, and it is very probable that there will be a very large reduction in the number of species when they are once well known. In many cases the sexes are extremely dissimilar and have been described as separate species.

S. athabasca Neum.

1883. Neum., Papilio, III, 143, *Syneda.*

HABITAT.—British Columbia.

This type is in Mr. Neumœgen's collection.

S. hudsonica G. & R.

1865. G. & R., Proc. Ent. Soc. Phil., IV, 494, pl. III, f. 7 and 8, *Syneda.*
1869. Bethune, Can. Ent., I, 87, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*
1883. Grt., Can. Ent., XV, 5, *Syneda.*

HABITAT.—Hudson Bay Territory; Canada; Montana.

I have not seen the type, nor do I know where it is to be found at present.

S. graphica Hbn.*

1818. Hbn., Zutræge, I, 8, f. 11, 12, *Drasteria.*
1852. Gen., Spec. Gen., Noct., III, 71, *Syneda.*
1857. Wlk., C. B. Mus., Het., XIII, 1162, *Syneda.*
1865. G. & R., Proc. Ent. Soc. Phil., IV, 495, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*
1880. Grt., Can. Ent., XII, 85, *Syneda.*
capticola Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1461, *Euclidia.*
1882. Grt., New List, 39, *Syneda.*
var. **media** Morr.
1875. Morr., Proc. Bost. Soc. N. H., XVIII, 125, pr. var.

HABITAT.—New York; New Jersey, in May; southward to Florida.

Walker's species is in the British Museum; Mr. Morrison's type is in the Meyer collection. Walker's type is quite the typical form of what is known in our collections as *graphica*.

S. divergens Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 27, *Syneda.*

HABITAT.—California; Colorado.

The type is probably with Dr. Behr.

S. petricola Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1462, *Euclidia.*
1882. Grt., New List, 39, *Syneda.*

HABITAT.—Rocky Mountains.

The type is in the British Museum. It is a small species near *adumbrata* Behr, and is not in the Grote collection. It seems a good species, and is, at all events, new to me.

S. alleni Grt.*

1877. Grt., Can. Ent., IX, 215, *Syneda.*
1878. Grt., Bull. Geol. Surv., IV, 183, *Syneda.*
saxea Hy. Edw.
1881. Hy. Edw., Papilio, I, 26, *Syneda adumbrata* var.
1882. Grt., New List, 39, pr. syn.

HABITAT.—Canada, in June and July; Maine; Nevada; Colorado.

Mr. Grote's type is in the British Museum; the type of *saxea* is in the Edwards collection.

S. adumbrata Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 27, *Syneda.*
1875. Grt., Can. Ent., VII, 70, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis..*

HABITAT.—California, in July; Nevada; Washington; Arizona; Colorada; Utah, in June.

I have not seen the type, which is probably in Dr. Behr's own collection.

S. occulta Hy. Edw.

1881. Hy. Edw., Papilio, I, 118, *Syneda.*

HABITAT.—Texas.

The type is with Mr. Neumœgen.

S. seposita Hy. Edw.*

1881. Hy. Edw., Papilio, I, 25, *Syneda.*

HABITAT.—Colorado; Utah.

The type is in the Neumœgen collection.

S. socia Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 27, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*

HABITAT.—California in July; Arizona; Colorado in August.

I have not seen the type, which is probably with Dr. Behr.

The type of Mr. Grote's species should be in the collection of the American Entomological Society; but I have not found it there.

S. perplexa Hy. Edw.

1884. Hy. Edw., Papilio, IV, 47, *Syneda.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

S. ingeniculata Morr.*

1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 435, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*

HABITAT.—Texas.

The type is in the Museum of Comparative Zoölogy at Cambridge and resembles *graphica* in a general way, but with less contrast of color and shade.

S. edwardsii Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 28, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*

HABITAT.—California.

The type is probably in Dr. Behr's hands.

Genus **CIRRHOBOLINA** Grt.

1875. Grt., Trans. Am. Ent. Soc., V, 117.

C. deducta Morr.*

1874. Morr., Proc. Bost. Soc. N. H., XVII, 220, *Syneda.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, *Cirrhobolina.*
♀ *pavitensis* Morr.
1874. Morr., Proc. Bost. Soc. N. H., XVII, 221, *Syneda.*
1875. Grt., Trans. Am. Ent. Soc., V, 117, pr. syn.

HABITAT.—Texas in April, May, June, July, August.

The types are in the Museum of Comparative Zoölogy at Cambridge and have been correctly referred as sexes of the same species. A duplicate type of *pavitensis* is in the Tepper collection.

C. mexicana Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 27, *Syneda.*
1882. Grt., New List, 39, *Cirrhobolina.*
incandescens Grt.
1875. Grt., Trans. Am. Ent. Soc., V, 117, *Cirrhobolina.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, an var. *deducta.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 38, an var. *deducta.*
1882. Grt., New List, 39, pr. syn.
var. **vulpina** Hy. Edw.
1882. Hy. Edw., Papilio, II, 14, pr. var.

HABITAT.—New Mexico; Arizona; Colorado; Texas in August and November.

1878. Graef, Bull. Bkln. Ent. Soc., I, 4, pr. var.
1878. Grt., Bull. Geol. Surv., IV, 184,= ♂ prec.
1888. Grt., Can. Ent., XX, 139,= ♂ prec.
1888. Moeschl., Ent. Amer., III, 197, *Bolina*.
fascicularis Gn.—partim.
1852. Gn., Spec. Gen., Noct., III, 63, *Bolina*.
1888. Moeschl., Ent. Amer., III, 197, pr. syn.

HABITAT.—Texas in April, May, and November; Colorado; Delaware in June.

The Grote and Robinson type I have not seen; but have seen specimens named by Mr. Grote. Dr. Harvey's type is in the British Museum from the Grote collection. There is no reasonable doubt that Dr. Harvey described only the normal male form.

M. hadeniformis Behr.

1870. Behr, Trans. Am. Ent. Soc., III, 25, *Syneda*.
1875. Grt., Check List, Noct., 40, *Melipotis*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis*.

HABITAT.—California.

The type is probably with Dr. Behr.

M. pallescens G. & R.*

1866. G. & R., Proc. Ent. Soc. Phil., VI, 21, pl. 3, f. 5, *Aedia*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 13, *Bolina*.
1876. Grote, List Noctuidæ, 40, *Melipotis*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis*.

HABITAT.—Texas in April and June; Colorado in August.

I have not seen the type; but there are specimens labeled by Mr. Grote in the British Museum.

M. perlæta Hy. Edw.

1882. Hy. Edw., Papilio, II, 14, *Melipotis*.

HABITAT.—Arizona.

The type is in the Neumœgen collection. See *Synedoida ægrotata* for a note on this species.

M. limbolaris Geyer.*

1825. Geyer, Zutræge, IV, ff. 689, 690, *Aedia*.
1852. Gn., Spec. Gen., Noct., III, 71, *Syneda*.
1857. Wlk., C. B. Mus., Het., XIII, 1168, *Syneda*.
1864. G. & R., Proc. Ent. Soc. Phil., IV, 494, *Syneda*.
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis*.
1881. Grt., Can. Ent., XIII, 91, *Melipotis*.
grandirena Haw.
1810. Haw., Lep. Britt., 264, *Phytometra*.
1829. Steph., Ill. Brit. Ent., Haust., III, 126, Note, ? *Ophiusa*.
1858. Wlk., C. B. Mus., Het., XIV, 1442, *Grammodes*.
1878. Butler, Proc. Zoöl. Soc. Lond., 1878, 487, pr. syn.

HABITAT.—New Hampshire; Massachusetts; New York in July, to Florida; Wisconsin.

M. tenella Hy. Edw.

1881 Hy. Edw., Papilio, I, 26, *Melipotis.*

HABITAT.—Texas.

The type is in the Neumœgen collection.

M. stygialis Grt.

1878. Grt., Bull. Geol. Surv., IV, 184, *Melipotis.*
1883. Grt., Can. Ent., XV, 5, *Melipotis.*

HABITAT.—Illinois; Texas.

The British Museum specimen is not the type, the location of which I do not know.

M. versabilis Harv.

1877. Harv., Can. Ent., IX, 94, *Melipotis* var. *jucunda.*
1880. Grt., Can. Ent., XII, 86, var. *jucunda.*
1883. Grt., Can. Ent., XV, 6, an sp. dist.

HABITAT.—Texas.

The type I have not seen, nor can I say where it is at present.

M. jucunda Hbn.*

1818. Hbn., Zutraege, I, 17 ff. 81, 82, *Melipotis.*
1816. Hbn., Verzeichniss, 280, *Melipotis.*
1857. Wlk., C. B. Mus., Het., XIII, 1145, *Bolina.*
1870. Behr, Trans. Am. Ent. Soc., III, 25, *Bolina.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 280, *Bolina.*
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 13, *Bolina.*
1878. Graef, Bull. Bkln. Ent. Soc., I, 54, *Leucanitis.*
1880. Grt., Can. Ent., XII, 86, *Melipotis.*
cinis Gn.
1852. Gn., Spec. Gen., Noct., III, 62, *Bolina.*
1857. Wlk., C. B. Mus., Het., XIII, 1145, pr. syn.
agrotipennis Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 280, *Bolina.*

HABITAT.—New York to Texas and Florida; Colorado in June; Texas in July and September.

Dr. Harvey's type is in the British Museum. *Agrotipennis* is a very dark form of *jucunda*. The characters pointed out by Dr. Harvey prove evanescent on examination of a good series.

M. sinualis Harv.*

1877. Harv., Can. Ent., IX, 94, *Melipotis.*

HABITAT.—Texas in May and September.

The type is in the British Museum.

Genus **HYPOGRAMMA** Gn.

1852. Gn., Spec. Gen., Noct., III, 34.

H. andromedæ Gn.

1852. Gn., Spec. Gen., Noct., III, 84, *Hypogramma.*
1857. Wlk., C. B. Mus., Het., XIII, 1095, *Hypogramma.*

HABITAT.—Georgia.

The species was described from a design by Abbot and has no type. So far as I am aware it has not been identified. Its recognition will be possible from the life history.

Genus **MAGUSA** Wlk.

1857. Wlk., C. B. Mus., Het., xi, 762.

M. divaricata Grt.*

1874. Grt., Sixth Rept. Peab. Ac. Sci., 37, *Stictoptera*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., ii, 281, *Stictoptera*.

HABITAT.—Wisconsin; New York; Florida; Texas in December.

The type is in the British Museum. The species belongs to *Magusa* rather than *Stictoptera*, and is very close to the *Magusa dissidens* Feld. and Rog., if not indeed the same. The latter species is in the Berliner Museum, in which I had a chance to compare typical *Stictoptera*. Moeschler has described a very closely allied species from the West Indies as a *Laphygma*.

Genus **CATOCALA** Schrank.

1802. Schrank, Fauna Boica, ii, 2, 158.

In this genus I have made no original studies and no comparisons. The species have been great favorites with collectors, and much has been written concerning their habits and variations. Mr. Grote and Mr. Hy. Edwards have devoted special attention to the genus; and, lastly, Dr. Hulst has given a monographic revision in the Bulletin of the Brooklyn Entomological Society, vii, pp. 15–56, 1884, in which the species are separated on structural peculiarities. This revision is followed here in essentials, and must be consulted in any study of the genus. The departures from the order given in the publication cited are all such as Dr. Hulst has himself suggested in the check list of Lepidoptera edited by me. I have not kept up my references as carefully in this genus as in some others, but I do not think I have omitted anything really important. A great many mere notes of captures and of habits are not referred to, though interesting in themselves and valuable to the student of geographical distribution. I did not examine the British Museum series, and therefore am not to be considered as indorsing the correctness of any synonymy given. My notes concerning the location of type specimens are meager, but there are few genera in which the literature is so good and the reference to actual types so seldom necessary. Most of the Hulst types are in the Rutgers College collection. Mr. Grote and Mr. Edwards have both examined the British Museum collection, and their references are probably accurate.

1872. Grt., Trans. Am. Ent Soc., iv, 18, sub nom. *androphila.*
1881. Coquillett, Papilio, i, 7, larva.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 29, 34, *Catocala.*
androphila Gn.
1852. Gn., Spec. Gen., Noct., iii, 106, *Catocala.*
1857. Wlk., C. B. Mus., Het., xiii, 1208, pr. syn.
var. **lineella** Grt.*
1872. Grt., Trans. Am. Ent. Soc., iv, 18, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 6, pr. syn.
1882. Grt., Papilio, ii, 9, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 34, pr. syn.
1892. Butler, Entomologist, xxv, 214, pr. syn.
var. **nerissa** Hy. Ed.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 61, pr. var.
1882. Grt., Papilio, ii, 9, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 34, *Catocala.*

HABITAT.—Massachusetts in July and August; New York to Texas June; Illinois; Central States.

The types of *nerissa* are in the Neumœgen and Edwards collections.

C. gracilis Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., ii, 511, *Catocala.*
1877. Grt., Can. Ent., ix, 169, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 31, 35, *Catocala.*
similis ‡ Grt.
1872. Grt., Trans. Am. Ent. Soc., iv, 9, 17, *Catocala.*
1877. Grt., Can. Ent., ix, 170, pr. syn.
var. **sordida** Grt.
1877. Grt., Can. Ent., ix, 170, pr. var.
1882. Grt., Papilio, ii, 9, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 35, *Catocala.*

HABITAT.—Canada in August; New York in July; Middle and uthern States.

C. minuta Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., ii, 512, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 17, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc. vii, 37, *Catocala.*
var. **parvula** Edw.
1864. Edw. (W. H.), Proc. Ent. Soc. Phil., ii, 512, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 17, pr. syn.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 35, pr. var.
var. **mellitula** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 35, pr. var.

HABITAT.—Eastern and Middle States.

Dr. Hulst's type is in the Rutgers College collection.

C. olivia Hy. Edw.

1880. Hy. Edw., Bull. Bkln. Ent. Soc., ii, 95, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 29, 35, *Catocala.*

HABITAT.—Texas.

The type is in the Neumœgen collection.

C. grynea Cram.*

1782. Cram., Pap. Ex., III, 29, pl. 208, f. H., *Phalæna.*
1811. Oliv., Enc. Meth., VIII, 291, *Noctua grinea.*
1816. Hbn., Verzeichniss, 278, *Ephesia.*
1857. Wlk., C. B. Mus., Het., XIII, 1205, *Catocala.*
1881. Grt., Can. Ent., XIII, 35, aberration.
1881. Kœbele, Bull. Bkln. Ent. Soc., IV, 22, larva.
1884. Bean, Can. Ent., XVI, 67, larva.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 35, *Catocala.*
polygama Gn. nec. Grt.
1852. Gn., Spec. Gen., Noct., III, 105, pl. 16, f. 2, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1207, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 36, pr. syn.
nuptula Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1205, *Catocala.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
var. **alabama** Grt.
1875. Grt., Proc. Ac. Nat. Sci. Phil., 1875, 427, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 6, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 36, pr. var.
ab. **constans** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, aberr. pr.

HABITAT.—Atlantic and Central States; Massachusetts in July and August.

C. præclara G. & R.*

1866. G. & R., Proc. Ent. Soc. Phil., VI, 25, pl. IV, f. 4, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 17, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 7, var. *grynea.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 36, an sp. dist.

HABITAT.—Canada in August; New York in July; Eastern States July and August.

C. micronympha Gn.*

1852. Gn., Spec. Gen., Noct., III, 102, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1204, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 15, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 29, *Catocala.*
fratercula G. & R.
1866. G. & R., Proc. Ent. Soc. Phil., VI, 24, pl. IV, f. 3, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 17, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 37, pl. V, f. 8, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. syn.
1891. Grt., Can. Ent., XXIII, 281, *Catocala.*
atarah Strk.
1874. Strk., Lep. Rhop. et Het., 97, pl. XI, f. 10 and 11, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 36, pr. syn.
var. **jacquenetta** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 60, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 36, pr. var.
var. **timandra** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 60, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. var.

var. **hero** Hy. Edw.
1884. Hy. Edw., Papilio, IV, 125, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. var.
var. **gisela** Meyer.
1880. Meyer, Bull. Bkln. Ent. Soc., II, 96, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. var.

HABITAT.—Canada and Massachusetts in August; Rhode Island; New York; Georgia; Florida; Texas in June; Illinois; Arizona; Colorado; California.

The type of *fratercula* is in the collection of the American Entomological Society; that of *atarrah* is with Mr. Strecker; those of *jacquenetta* are in the Lintner and Edwards collections; that of *timandra* is with Mr. Neumœgen; that of *hero* is in the Edwards collection, and, finally, that of *gisela* is in the Meyer collection.

C. similis Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., II, 511, *Catocala.*
1872. Grt., Trans. Am. Ent Soc., IV, 17,=*gracilis* (err.)
1872. Grt., Can. Ent., IX, 169, *Catocala.*
1881. Grt., Papilio, I, 159, *Catocala.*
1884. Grt., Bull. Bkln. Ent. Soc., VII, 29, 37, *Catocala.*
amasia ‡ S. & A.
1797. S. & A., Ins. Ga., II, 179, pl. 90, lower figure, *Phalæna.*
1852. Gn., Spec. Gen., Noct., III, 103, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. syn.
formula G. & R.
1866. G. & R., Proc. Ent. Soc. Phil., VI, 27, pl. IV, f. 5, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 16, *Catocala.*
1882. Grt., New List, 40, pr. syn.
var. **aholah** Strk.
1874. Strk., Lep. Rhop. et Het., 96, pl. XI, f. 8, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 6, an var. *formula.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. var.
var. **isabella** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 60, var. *formula.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 37, pr. var.

HABITAT.—Rhode Island; New York in August, to Texas in May and June.

C. chelidonia Grt.

1881. Grt., Papilio, I, 159, *Catocala.*
1882. Grt., Ill. Essay, 67, pl. IV, f. 42, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 29, 37, *Catocala.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

C. amasia S. & A.*

1797. S. & A., Ins. Ga., II, 178, pl. 90, (upper figure), *Phalæna.*
1811. Oliv., Enc. Meth., VIII, 291, *Noctua.*
1841. Westw., in Jardine Nat. Libr., XXXVII, 205, pl. 26, f. 3, *Catocala.*
1852. Gn., Spec. Gen., Noct., III, 103, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1204, *Catocala.*

C. blandula Hulst.*

1884. Hulst, Bull. Bkln. Ent. Soc., vii, 38, *Catocala.*
polygama ‡ Grt.
1872 Grt., Trans. Am. Ent. Soc., iv, 15, *Catocala.*
1869. Reed, Can. Ent., ii, 30, larva.
1876. Saund., Can. Ent., viii, 72, larva.
1878. Lint., Ent. Cont., iv, 101, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 39, pr. syn.

HABITAT.—Northern, Eastern, and Middle States; Canada, in July d August.

C. mira Grt.*

1876. Grt., Can. Ent., viii, 230, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 7, an var. *polygama.*
1882. Grt., Ill. Essay, 70, pl. 4, f. 43, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 29, 39, sp. dist.

HABITAT.—Southern States; Florida; Kansas.

C. abbreviatella Grt.*

1872. Grt., Trans. Am. Ent. Soc., iv, 14, *Catocala.*
1877. Grt., Can. Ent., ix, 169, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 7,= *nuptialis.*
1882. Grt., Ill. Essay, 66, pl. iv, f. 40, *Catocala.*
1884. Angus, Papilio, iv, 37, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 39, *Catocala.*
var. **whitneyi** Dodge.
1874. Dodge, Can. Ent., vi, 125, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 7, *abbreviatella* var.
1884. Angus, Papilio, iv, 37, an sp. dist.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 39, pr. var.

HABITAT.—Illinois; Iowa; Minnesota; Kansas; Nebraska; Utah; xas.

C. nuptialis Wlk.*

1857. Wlk., C. B. Mus., Het., iii, 1206, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 14, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 222, *Catocala.*
1884. Angus, Papilio, iv, 37, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 39, *Catocala.*
myrrha Strk.
1874. Strk., Lep. Rhop. et Het., 97, pl. xi, f. 12, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., ii, 222, pr. syn.

HABITAT.—Illinois in August; Nebraska to Texas; Colorado.

C. clintonii Grt.*

1865. Grt., Proc. Ent. Soc. Phil., iii, 89, pl. iii, f. 4, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 13, *Catocala.*
1873. Strk , Lep. Rhop. et Het., 35, pl. v, f. 6, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 39, *Catocala.*
var. **helene** Pilate.
1882. Pilate, Papilio, ii, 31, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 39, pr. syn.

HABITAT.—Canada, Middle and Central States, in July; Texas, in pril and May; Florida.

C. frederici Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 14, *Catocala.*
1877. Grt., Can. Ent., IX, 168, *Catocala.*
1882. Grt., Ill. Essay, 71, pl. IV, f. 44, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 40, *Catocala.*

HABITAT.—Texas; New Mexico; Colorado.

C. illecta Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1205, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 13, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, *Catocala.*
magdalena Strk.
1874. Strk., Lep. Rhop, et Het., 93, pl. XI, f. 9, *Catocala.*
1874. Grt., Can. Ent., VI, 199, pr. syn.
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 222, pr. syn.

HABITAT.—Illinois; Nebraska; Texas.

C. amestris Strk.

1874. Strk., Lep. Rhop. et Het., 96, pl. XI, f. 6, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 222,= *anna.*
1881. Grt., Papilio, I, 161,= *anna.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, *Catocala.*
anna Grt.
1874. Grt., Trans. Am. Ent. Soc., V, 96, *Catocala.*
1875. Strk., Lep. Rhop. et Het., 105, pr. syn.
1877. Grt. Can. Ent., IX, 168, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 8, pr. syn.
1881. Hulst, Papilio, I, 215, pr. syn.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, pr. syn.
var. **westcottii** Grt.
1878. Grt., Can. Ent., X, 195, *Catocala.*
1882. Grt., Papilio, II, 9, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, pr. syn.

HABITAT.—Wisconsin; Illinois; Nebraska; Texas.

C. consors S. & A.*

1797. S. & A., Ins. Ga., II, 177, pl. 89, *Phalæna.*
1811. Oliv., Enc. Meth., VIII, 290, *Noctua.*
1841. Duncan, in Jardine's Nat. Libr., XXXII, 206, *Catocala.*
1852. Gn., Spec. Gen., Noct., III, 99, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1204, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 11, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 75, pl. IX, f. 10, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, *Catocala.*

HABITAT.—Pennsylvania, southward; Mississippi; Texas.

C. andromache Hy. Edw.

1885. Hy. Edw., Ent. Amer., I, 50, *Catocala.*

HABITAT.—California.

The types are in the Neumœgen and Edwards collections.

C. delilah Strk.*

1874. Strk., Lep. Rhop. et Het., 96, pl. XI, f. 7, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 222,=*adoptiva.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 41, *Catocala.*
adoptiva Grt.
1874. Grt., Trans. Am. Ent. Soc., V, 96, *Catocala.*
1875. Strk., Lep. Rhop. et Het., 105, pr. syn.
1880. Hulst, Bull. Bkln. Ent. Soc., III, 10, pr. syn.
1881. Grt., Papilio, I, 161, an nom. prior.
1881. Hulst, Papilio, I, 215, pr. syn.
var. **desdemona** Hy. Edw.
1882. Edw., Papilio, II, 15, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. var.
var. **calphurnia** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 59, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. var.

HABITAT.—Illinois; Nebraska; Kansas; Arizona; Texas, in May. Dr. Strecker's type is in his own collection; the type of *desdemona* is in the Neumœgen collection; that of *calphurnia* is in the Bailey collection.

C. cerogama Gn.*

1852. Gn., Spec. Gen., Noct., III, 96, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1202, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 9, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 23, pl. III, f. 10, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 30, 41, *Catocala.*
aurella Fischer.
1885. Fischer, Can. Ent., XVII, 133, *Catocala.*
eliza Fischer.
1885. Fischer, Can. Ent., XVII, 134, *Catocala.*
var. **bunkeri** Grt.
1876. Grt., Can. Ent., VIII, 230, var. pr.
1880. Hulst, Bull. Bkln. Ent. Soc., III, 10, pr. var.
1882. Grt., Papilio, II, 9, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. syn.

HABITAT.—Canada; Eastern, Middle, and Central States; Maryland, July to September.

C. verrilliana Grt.*

1875. Grt., Can. Ent., VII, 185, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., III, 12, 217, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 30, 41, *Catocala.*
ophelia Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., II, 95, pr. var.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 58, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. syn.
var. **violenta** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 58, *Catocala.*
1883. Grt., Trans. Kans. Ac. Sci., VIII, 50, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. syn.
var. **votiva** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 41, pr. var.

HABITAT.—Colorado in October; Texas, April, May, and June; New Mexico; Arizona; California.

Types of *ophelia* and *violenta* are in Mr. Neumœgen's collection, and in the Edwards collection is another type of *violenta*

C. ultronia Hbn.*

1818. Hbn., Zuträge, ii, 26, f. 347, 348, *Eunetis*.
1816. Hbn., Verzeichniss, 277, *Eunetis*.
1852. Gn., Spec. Gen., Noct., iii, 89, *Catocala*.
1857. Wlk., C. B. Mus., Het., xiii, 1197, *Catocala*.
1869. Pack., Guide to Study Ins., 317, pl. viii, f. 4, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., iv, 6, *Catocala*.
1874. Strk., Lep. Rhop. et Het., 75, pl. ix, f. 7, *Catocala*.
1874. Saund., Can. Ent., vi, 147, *Catocala*.
1880. Saund., Can. Ent., xii, 4, *Catocala*.
1883. Saund., Fruit Insects, 177, f. 188, 189, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 42, *Catocala*.
1884. Bean, Can. Ent., xvi, 67, *Catocala*.
var. **celia** Hy. Edw.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 58, pr. var.
1884. Hulst, Bull. Bkln, Ent. Soc., vii, 42, pr. var.
var. **mopsa** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 58, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, pr. var.
var. **adriana** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 57, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, pr. var.
var. **herodias** Strk.
1876. Strk., Lep. Rhop. et Het., 121, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. var.

HABITAT.—Canada to Florida, and Texas, west to the great plains. July and August.

A type of *celia* is with Mr. Neumœgen. Types of *celia*, *mopsa*, and *adriana* are in the Edwards collection.

C. coccinata Grt.*

1872. Grt., Trans. Am. Ent. Soc., iv, 6, *Catocala*.
1873. Strk., Lep. Rhop. et Het., 21, pl. 3, f. 9, *Catocala*.
1881. Coquillett, Papilio, i, 56, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 42, *Catocala*.
circe Strk.
1876. Strk., Lep. Rhop. et Het., 121, pr. var.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 57, an sp. dist.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
var. **sinuosa** Grt.
1879. Grt., Bull. Bkln. Ent. Soc., i, 77, *Catocala*.
1879. Grt., Can. Ent., xi, 15, *Catocala*.
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 11, pr. var.
1882. Grt., Papilio, ii, 8, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. var.

HABITAT.—Canada to Florida, to Texas; Illinois; Central States; Canada and New York, July to September.

C. ilia Cram.*

1779. Cram., Lep. Ex., i, 53, pl. 33, f. *B. C.*, *Phalœna.*
1810. Oliv., Enc. Meth., viii, 286, *Noctua.*
1816. Hbn., Verzeichniss, 277, *Eunetis.*
1852. Gn., Spec. Gen., Noct., iii, 91, *Catocala.*
1857. Wlk., C. B. Mus., Het., xiii, 1199, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 8, *Catocala.*
1875. Caulfield, Can. Ent., vii, 208, larva.
1882. Koebele, Bull. Bkln. Ent. Soc., v, 22, larva.
1883. Worthington, Papilio, iii, 40, *Catocala.*
1884. French, Can. Ent., xvi, 12, life history.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 42, *Catocala.*
var. **uxor** Gn.*
1852. Gn., Spec. Gen., Noct., iii, 92, *Catocala.*
1857. Wlk., C. B. Mus., Het., xiii, 1199, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 8, ? pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. var.
umbrosa Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
confusa Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
decorata Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
obsoleta Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
duplicata Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
conspicua Worth.
1883. Worthington, Papilio, iii, 40, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 42, pr. syn.
var. **zoe** Behr.
1870. Behr, Trans. Am. Ent. Soc., iii, 24, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 214, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 10, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, pr. var.
var. **osculata** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, pr. var.

HABITAT.—Canada; United States generally. Canada and Eastern States, July to September.

C. aholibah Strk.*

1874. Strk., Lep. Rhop. et Het., 72, pl. ix, f. 5, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 213, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 31, 43, *Catocala.*

HABITAT.—California; Washington; Oregon; Colorado in August; New Mexico.

C. marmorata Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., ii, 508, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 7, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 73, pl. ix, f. 6, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., vi, 212, *Catocala.*
1877. Angus, Can. Ent., ix, 239, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, 30, *Catocala.*
1887. Angus, Ent. Amer., iii, 3, *Catocala.*

Habitat.—New York; Ohio; Kentucky; California. Found in isolated specimens throughout the United States.

C. parta Gn.*

1852. Gn., Spec. Gen., Noct., iii, 84, pl. xvi, f. 1, *Catocala.*
1857. Wlk., C. B. Mus., Het., xiii, 1193, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 6, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 38, pl. v, f. 10, *Catocala.*
1883. Hy. Edw., Papilio, iii, 24, larva.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 30, 43, *Catocala.*
amatrix ‡ Wlk.
1857. Wlk., C. B. Mus., Het., xiii, 1195, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 6, pr. syn.
var. **perplexa** Strk.
1874. Strk., Lep. Rhop. et Het., 38, pl. v, f. 11, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 10, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 43, pr. syn.
var. **petulans** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc. vii, 43, pr. var.

Habitat.—Eastern and Northern United States, July to October; Canada, July to September; Hudson's Bay territory; Colorado.

C. unijuga Wlk.*

1857. Wlk., C. B. Mus., Het., xiii, 1194, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 5, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 37, pl. v, f. 9, *Catocala.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 55, *Catocala.*
1881. Kellicott, Can. Ent., xiii, 38, larva on *Populus.*
1883. Bunker, Can. Ent., xv, 100, larva on *Willow.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 44, *Catocala.*
junctura ‡ Grt.
1872. Grt., Trans. Am. Ent. Soc., iv, 5, *Catocala.*
1877. Grt., Can. Ent., ix, 168, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 10, pr. syn.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., iii, 56, var. *unijuga.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 44, pr. syn.
lucilla Worth.
1883. Worthington, Papilio, iii, 39, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 44, pr. syn.
var. **meskei** Grt.
1873. Grt., Can. Ent., vi, 161, 233, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 70, pr. syn.
1877. Grt., Can. Ent., ix, 168, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 10, pr. var.

1880. Edw., Bull. Bkln. Ent. Soc., III, 55, *Catocala.*
1883. Bunker, Can. Ent., XV, 100, larva.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 44, pr. var.
var. **beaniana** Grt.
1878. Grt., Can. Ent., X, 195, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 11, var. *briseis.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 55, an sp. dist.
1882. Grt., Ill. Essay, 67, pl. IV, f. 42, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII. 44, pr. var.

HABITAT.—New York to Illinois to Hudson's Bay territory; Northern and Eastern States, July to September; Colorado.

C. pura Hulst.*

1880. Hulst, Bull. Bkln. Ent. Soc., II, 96, *Catocala.*
1881. Grt., Papilio, I, 163, = *semirelicta.*
1881. Grt., Trans. Kans. Ac. Sci., VII, 69, = *semirelicta.*
1881. Hulst, Papilio, I, 163, an sp. dist.
1883. Grt., Can. Ent., XV, 11, = *semirelicta.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 30, 44, sp. dist.

HABITAT.—Kansas; Colorado in October; New Mexico.

The type is in the Hulst collection.

C. stretchii Behr.

1870. Behr, Trans. Am. Ent. Soc., III, 24, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 212, *Catocala.*
1877. Strk., Lep. Rhop. et Het., 130, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 30, 44, *Catocala.*
var. **portia** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., II, 94, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. var.
var. **augusta** Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 184, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. var.
var. **hippolyta** Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 211, *Catocala.*
1874. Hy. Edw., in Strk. Rhop. et Het., 99, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. var.
jessica Hy. Edw.
1877. Hy. Edw., Pacific Coast Lep. No. 25, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. syn.

HABITAT.—California; Arizona; Nevada; Colorado.

Mr. Edwards's types are, I believe, all in his own collection.

C. rosalinda Hy. Edw.

1880. Hy Edw., Bull. Bkln. Ent. Soc., III, 55, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 45, *Catocala.*

HABITAT.—Colorado; Kansas.

Types are in the Bailey and Edwards collections.

C. faustina Strk.*

1873. Strk., Lep. Rhop. et Het., 21, pl. III, f. 8, *Catocala.*
1874. Grt., Proc. Bost. Soc. N. H., XVI, 243, *Catocala.*

1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 210, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 45, *Catocala.*
perdita Hy. Edw.
1874. Hy. Edw., in Strk. Lep. Rhop. et Het., 100, *Catocala.*
1877. Strk., Lep. Rhop. et Het., 129, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 10, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. syn.
zillah Strk.
1877. Strk., Lep. Rhop. et Het., 129, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. syn.
var. **verecunda** Hulst.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. var.
var. **allusa** Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, *Catocala.*
1891. Hulst, in Smith's List Lep., 59, pr. var.

HABITAT.—Michigan; Nevada; Montana; Colorado in October; Washington; California; Arizona; New Mexico; Utah.

The types are in each case in the collections of the describers, except that the type of *allusa* is with Mr. Graef.

C. mariana Hy. Edw.*

1874. Hy. Edw., in Strk., Lep., Rhop. et Het., 99, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 210, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 45, *Catocala.*
var. **francisca** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 57, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 45, pr. var.

HABITAT.—California; Colorado in October.

The types are in the Edwards collection; a type of the variety also with Mr. Neumœgen.

C. briseis Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc., Phil., II, 508, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 5, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 20, pl. 3, f. 7, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 30, 45, *Catocala.*
parta ‡ Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1193, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 5, pr. syn.
var. **groteiana** Bailey.*
1879. Bailey, North Amer. Ent., I, 21, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 11, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.
var. **semirelicta** Grt.
1874. Grt., 6th Rept. Peab. Ac. Sci., 35, *Catocala.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, pl. 1, f. 11, *Catocala.*
1876. Strk., Lep. Rhop. et Het., 121, pr. syn.
1880. Hulst, Bull. Bkln. Ent. Soc., III, 11, pr. var.
1881. Grt., Papilio, I, 163, an sp. dist.
1881. Hulst, Papilio, I, 218, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.

HABITAT.—Canada; Northern, Eastern, and Middle States, July to September; Colorado in October; New Mexico.

A specimen of *briseis* labeled by Mr. W. H. Edwards is in the collection of the American Entomological Society; but I am not certain that it is the type. The type of *groteiana* is in the Bailey collection.

C. hermia Hy. Edw.*

1880. Hy. Edw., Bull. Bkln. Ent. Soc., II, 93, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 46, *Catocala.*

HABITAT.—Colorado; New Mexico.

The type is in the Edwards collection.

C. electilis Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1209, *Catocala.*
1881. Butler, Papilio, I, 171, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 46, *Catocala.*
var. **californica** Edw.*
1864. Edw. (W. H.), Proc. Ent. Soc. Phil., II, 509, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 5, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 98, pl. 11, f. 13, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 211, *Catocala.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 55, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 40, pr. var.
var **cleopatra** Hy. Edw.
1874. Hy. Edw., in Strk. Lep. Rhop. et Het., 99, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 209, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 11, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.
var. **irene** Behr.
1870. Behr, Trans. Am. Ent. Soc., III, 24, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 211, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.
virgilia, Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 56, var. *irene.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. syn.
var. **volumnia** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 56, var. *irene.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.
var **valeria** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 56, var. *irene.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. syn.

HABITAT.—California; Mexico; Colorado; Arizona; Nevada.

Walker's type is probably in the British Museum. The type of W. H. Edwards's species is in the collection of the American Entomological Society. The types of the described varieties are in Mr. Hy. Edwards's collection; types of *virgilia* and *valeria* also with Mr. Neumœgen.

C. luciana Hy. Edw.

1874. Hy. Edw., in Strk., Lep., Rhop. et Het., 99, *Catocala.*
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 211, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 47, *Catocala.*
nebraskæ Dodge.
1875. Dodge, Can. Ent., VII, 2, *Catocala.*

1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 54, pr. syn.
var **somnus** Dodge.
1881. Dodge, Can. Ent., XII, 40, var. *nebraskæ*.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 46, pr. var.

HABITAT.—Colorado; Kansas; Nebraska.

The type of *luciana* is the Edwards collection.

C. concumbens Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1198, *Catocala*.
1863. Saund., Proc. Ent. Soc. Phil., III, 29, larva.
1872. Grt., Trans. Am. Ent. Soc., IV, 7, *Catocala*.
1873. Strk., Lep. Rhop. et Het., 38, pl. 5, f. 12, *Catocala*.
1875. Strk., Lep. Rhop. et Het., 106, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 47, *Catocala*.
var. **diana** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 57, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 47, pr. var.
aberr. **hillii** Grt.
1883. Grt., Papilio, III, 43, an aberr. pr.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 47, aberr. pr.

HABITAT.—Canada; Northern, Eastern, and Middle States, August and September.

The type of *diana* is in the Allen collection, that of *hillii* is in the Hill collection.

C. cara Gn.*

1852. Gn., Spec. Gen., Noct., III, 87, *Catocala*.
1857. Wlk., C. B. Mus., Het., XIII, 1196, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., IV, 7, *Catocala*.
1875. Strk., Lep. Rhop. et Het., 98, pl. XI, f. 14, *Catocala*.
1880. Kœbele, Bull. Bkln. Ent. Soc., III, 22, larva.
1882. French, Papilio, II, 167, life history.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 47, *Catocala*.
var. **carissima** Hulst.*
1880. Hulst, Bull. Bkln. Ent. Soc., II, 97, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc. VII, 47, pr. var.
sylvia Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 57, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 47,=*carissima*.

HABITAT.—Canada to Florida; Southern and Central States, Texas, Northern and Central States, August to October.

The type of *carissima* is in the Hulst collection; that of *sylvia* is in the Edwards collection.

C. amatrix Hbn.*

1810. Hbn., Samml. Ex. Schmett., II, Noct. f. 427, *Lamprosia*.
1816. Hbn., Verzeichniss, 277, *Lamprosia*.
1852. Gn., Spec. Gen., Noct., III, 86, *Catocala*.
1857. Wlk., C. B. Mus., Het., XIII, 1195, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., IV, 7, *Catocala*.
1875. Strk., Lep. Rhop. et Het., 98, pl. XI, f. 15, 16, *Catocala*.
1881. Kellicott, Papilio, I, 142, larva.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 47, *Catocala*.

1884. French, Papilio, IV, 8, life history.
selecta Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1197, *Catocala.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
1872. Grt., Trans. Am. Ent. Soc., IV, 7, pr. syn.
parta ‡ Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1193, *Catocala.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
editha Edw.
1874. Edw. (W. H.), Trans. Am. Ent. Soc., V, 112, *Catocala.*
1876. Mead, in Wheeler's Rept. Surv. West 100 Merid., V, 790, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 12, pr. syn.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 47, pr. syn.
var. **nurus** Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1197, *Catocala.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
1872. Grt., Trans. Am. Ent. Soc., IV, 7, pr. syn.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. var.

HABITAT.—Nova Scotia to Texas, to Florida; Arizona; Colorado August; Northern range, August to October.

C. junctura Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1196, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 5, *Catocala.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 56, an var. ***unijuga.***
1882. Grt., Can. Ent., XIV, 47, *Catocala.*
1883. Grt., Can. Ent., XV, 12, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 48, *Catocala.*
walshii Edw.
1864. Edw. (W. H.), Proc. Ent. Soc. Phil., II, 509, *Catocala.*
1873. Grt., Can. Ent., V, 163, 233, *Catacola.*
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 55, *Catocala.*
1881. Grt., Papilio, I, 163, *Catocala.*
1881. Hulst, Papilio, I, 218, *Catocala.*
1882. Grt., Can. Ent., XIV, 47, pr. syn.
1883. Grt., Can. Ent., XV, 12, pr. syn.
1884. Strk., Papilio, IV, 74, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. syn.
1886. French, Can. Ent., XVIII, 161, an var. dist.
var. **arizonæ** Grt.
1873. Grt., Can. Ent., V, 163, 233, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 12, =*walshii.*
1881. Grt., Can. Ent., XIII, 232, an sp. dist.
1883. Grt., Can. Ent., XV, 12, an sp. dist.
1884. Strk., Papilio, IV, 74, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. var.
var. **aspasai** Strk.
1874. Strk., Lep. Rhop. et Het., 94, *Catocala.*
1874. Grt., Can. Ent., VI, 199, = *arizonæ.*
1883. Grt., Can. Ent., XV, 12, pr. syn.
1884. Strk., Papilio, IV, 74, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. var.
var. **cassandra** Hy. Edw.
1875. Hy. Edw., Proc. Cal. Ac. Sci., VI, 214, *Catocala.*

1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 56, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. var.
sara French.
1883. French, Can. Ent., XV, 163, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, =*cassandra*.

HABITAT.—Texas to California: Colorado: Utah: New Mexico.

The type of *junctura* is in the British Museum: that of *walshii* is, I believe, destroyed; that of *arizonæ* is in the collection of the American Entomological Society; that of *aspasia* is in the Strecker collection; that of *cassandra* is in the Edwards collection, while that of *sara* is, I believe, with Prof. French.

This species has made as much bad blood as almost any other American noctuid, and even now the synonomy above given will probably be questioned by some.

C. babayaga Strck.

1884. Strk., Papilio, IV, 73, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, *Catocala*.
arizonæ ‡ Grt.
1881. Grt., Can. Ent., XIII, 232, *Catocala*.
1883. Grt., Can. Ent., XV, 12, *Catocala*.
1884. Strk., Papilio, IV, 73, pr. syn.

HABITAT.—Arizona.

The type is with Dr. Strecker.

C. relicta Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1192, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., IV, 4, *Catocala*.
1873. Strk., Lep. Rhop. et Het., 19, pl. III, f. 5 and 6. *Catocala*.
1875. Grt., Can. Ent., VII, 186, *Catocala*.
1876. Grt., Can. Ent., VIII, 231, *Catocala*.
1876. Grt., Ann. Lyc. Nat. Hist. N. Y., XI, 301, *Catocala*.
1884. Hulst. Bull. Bkln. Ent. Soc., VII, 31, 48, *Catocala*.
1886. French, Can. Ent., VIII, 162, *Catocala*.
1888. Clark, Can. Ent., XX, 17, life history.
fraxini ‡ Gn.
1852. Gn., Spec. Gen., Noct., III, 83, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., IV, 4, pr. syn.
var **phrynia** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 54, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. syn.
var **bianca** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 54, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 48, pr. syn.

HABITAT.—Nova Scotia to New York; Middle States July to October; Oregon; Colorado.

Types of the varieties are in the Hill and Edwards collections.

C. elda Behrens.

1887. Behrens, Can. Ent., XIX, 199, *Catocala.*

HABITAT.—Oregon.

The type is in Dr. Behrens's collection, and a duplicate is in the nerican Museum of Natural History. The locality, Oregon, for *relicta* perhaps due to a misnamed specimen of this species.

C. tristis Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., II, 511, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 4, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 17, pl. III, f. 1, *Catocala.*
1874. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 49, *Catocala.*

HABITAT.—Canada, Northern, Eastern, Middle, and Central States, ıgust.

C. epione Dru.*

1773. Drury, Illustr., 1, 46, pl. 23, f. 2, *Noctua.*
1779. Cram., Pap. Ex., II, 9, pl. 102, f. E. F., *Noctua.*
1781. Fabr., Spec. Ins., II, 222, *Noctua.*
1787. Fabr., Mant. Ins., II, 151, *Noctua.*
1788. Gmel., ed. Linn. Syst. Nat., V, 2538, *Noctua.*
1794. Fabr., Ent. Syst., III, 2, 58, *Noctua.*
1811. Oliv., Enc. Meth., 288, pl. LXXXV, f, 6, *Noctua.*
1816. Hbn., Verzeichniss, 276, *Mormonia.*
1840. Westw., ed. Dru. Illustr., I, 44, pl. XXIII, f. 2, *Catocala.*
1852. Gn., Spec. Gen., Noct., III, 93, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1200, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 2, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 31, 49, *Catocala.*

HABITAT.—Canada, Northern, Eastern, Middle, and Central States, ıly.

§ CATABAPTA Hulst.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 21.

C. antinympha Hbn.*

1816. Hbn., Verzeichniss, 278, *Ephesia.*
1857. Wlk., C. B. Mus., Het., XIII, 1203, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 13, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 36, pl. V, f. 7, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 49, *Catabapta.*
paranympha ‡ Drury.
1773. Drury, Illustr., I, pl. 23, f. 6, *Phalæna.*
1816. Hbn., Verzeichniss, 278, pr. syn.
affinis Westw.
1840. Westw., ed. Drury, Illustr., I, 44, pl. 23, f. 6, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1203, pr. syn.
melanympha Gn.
1852. Gn., Spec. Gen., Noct., III, 98, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1203, pr. syn.

HABITAT.—Canada to Maryland; west to the Mississippi Valley, ıly and August.

C. serena Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., II, 510, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 13, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 23, pl. III, f. 11, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 49, *Catabapta.*

HABITAT.—Canada; northern and eastern United States—eastern Siberia. July.

C. badia G. & R.*

1868. G. & R., Proc. Ent. Soc. Phila., VII, 22, pl. IV, f. 1, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 12, *Catocala.*
1876. Andrews, Can. Ent., VIII, 198, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 49, *Catabapta.*
1887. Hulst, Ento. Amer., III, 27, *Catocala.*
var. **coelebs** Grt.*
1874. Grt., Trans. Am. Ent. Soc., V, 96, *Catocala.*
1878. Grt., Can. Ent., X, 233, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 9, pr. var.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 50, as sp. dist.
1883. Grt., Can. Ent. XV, 23, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 50, pr. var.
var. **phœbe** Hy. Edw.
1884. Hy. Edw., Papilio, IV, 125, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 50, pr. var.

HABITAT.—Canada; Northern, Eastern, and Middle States, August. The type of *phœbe* is in the Edwards Collection.

C. muliercula Gn.*

1852. Gn., Spec. Gen., Noct., III, 97, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1203, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 12, *Catocala.*
1874. Strk., Lep. Rhop. et. Het., 74, pl. IX, f. 9, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 50, *Catabapta.*
var. **peramans** Hulst.
1884. Hulst., Bull. Bkln. Ent. Soc., VII, 50, pr. var.

HABITAT.—Eastern and central United States.

C. habilis Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 11, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., VIII, 32, 50, *Catabapta.*
1886. Kellicott, Ent. Amer., II, 46, larva.
var. **basalis** Grt.
1876. Grt., Can. Ent., VIII, 230, pr. var.
1880. Hulst, Bull. Bkln. Ent. Soc., VII, 50, pr. syn.
1882. Grt., Papilio, II, 9, pr. var.

HABITAT.—Canada; Eastern, Middle, and Central States, August to October.

C. innubens Gn.*

1852. Gn., Spec. Gen., Noct., III, 98, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1203, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 8, *Catocala.*

1884. Hulst, Bull. Bkln. Ent. Soc., vii, 50, *Catabapta.*
1888. French, Can. Ent., xx, 170, larva.
var. **hinda** French.
1881. French, Papilio, i, 111, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 50, pr. syn.
var. **flavidalis** Grt.*
1874. Grt., Trans. Am. Ent. Soc., v, 95, pr. var.
1881. Grt., Papilio, i, 163, pr. var.
1882. Grt., Papilio, ii, 9, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., viii, 50, pr. var.
var. **scintillans** G. & R.*
1866. G. & R., Proc. Ent. Soc. Phil., vi, 28, pl. iv, f. 6, *Catocala.*
1872. Grt., Trans Am. Ent. Soc., iv, 8, pr. var.
1882. Grt., Papilio, ii, 8, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 50, pr. var.

HABITAT.—Canada, in September and August; Eastern, Middle, nd Central United States; Illinois, in June; Wisconsin.

C. **paleogama** Gn.*

1852. Gn., Spec. Gen., Noct., iii, 97, *Catocala.*
1857. Wlk., C. B. Mus., Het., xiii, 1202, *Catocala.*
1865. Grt., Proc. Ent. Soc. Phil., iii, 87 et 541, pl. 3, f. 2, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 10, 11, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 32, 51, *Catabapta.*
annida Fager.
1882. Fager, Can. Ent., xiv, 120, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 51, pr. syn.
var. **phalanga** Grt.*
1865. Grt., Proc. Ent. Soc. Phil., iii, 86, pl. iii, f. 1, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 11, pr. var.
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 9, aberr. pr.
1882. Grt., Papilio, ii, 9, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 51, pr. var.

HABITAT.—Eastern, Middle, and Central States, July and August.

C **neogama** S. & A.*

1797. S. & A., Ins. Ga., ii, 175, pl. 88, *Phalæna.*
1811. Oliv., Enc. Meth., viii, 290, *Noctua.*
1840. Duncan, in Jardine Nat. Libr., 37, 202, pl. 26, ff. 1-2, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., iv, 9, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 35, pl. 5, ff. 4, 5, *Catocala.*
1881. Grt., Papilio, i, 163, *Catocala.*
1882. Grt., Papilio, ii, 8, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 32, 51, *Catabapta.*
var. **communis** Grt.
1872. Grt., Trans. Am. Ent. Soc., iv, 9, *Catocala.*
1875. Grt., Bull. Bkln. Ent. Soc., ii, 221, *Catocala.*
1882. Grt., Papilio, ii, 8, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 52, pr. syn.
1887. Grt., Can. Ent., xix, 113, an sp. dist.
neogama ‡ Gn.
1852. Gn., Spec. Gen., Noct., iii, 96, *Catocala.*

1857. Wlk., C. B. Mus., Het., xiii, 1202, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., iv, 9, = *communis*.
1887. Grt., Can. Ent., xix, 113, = *communis*.
var. **snoviana** Grt.
1876. Grt., List Noctuidæ, 41, *Catocala*.
1880. Hulst, Bull Bkln. Ent. Soc., iii, 10, an var. *ilia*.
1881. Grt., Papilio, 1, 8, an sp. dist. *ilia*.
1882. Grt., Papilio, ii, 7, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 51, pr. var.?

HABITAT.—United States east of the Rocky Mountains; Kansas; Arizona. Eastern range in July and August.

The type of *snoviana* is in the Edwards collection.

C. subnata Grt.*

1865. Grt., Proc. Ent. Soc. Phil., iii, 326, pl. iv, f. 5, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., iv, 9, *Catocala*.
1873. Strk., Lep. Rhop. et Het., 34, 106, pl. v, f. 3, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 32, 51, *Catabapta*.

HABITAT.—Eastern and central United States. New York in August.

C. piatrix Grt.*

1865. Grt., Proc. Ent. Soc. Phil., iii, 88, 532, pl. iii, f. 3, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., iv, 10, *Catocala*.
1874. Strk., Lep. Rhop. et Het., 74, pl. ix, f. 8, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 32, 52, *Catabapta*.
var. **dionyza** Hy. Edw.
1884. Hy. Edw., Papilio, iv, 124, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 52 pr. var.

HABITAT.—United States east of the Rocky Mountains; Arizona; Texas in July. Northern range August and September.

The type of *dionyza* is with Mr. Neumœgen.

C. nebulosa Edw.*

1864. Edw. (W. H.), Proc. Ent. Soc. Phil., ii, 510, *Catocala*.
1872. Grt., Trans. Am. Ent. Soc., iv, 11, *Catocala*.
1874. Strk., Lep. Rhop. et Het., 75, pl. ix, f. 11, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 32, 52, *Catabapta*.
ponderosa G. & R.
1866. G. & R., Proc. Ent. Soc. Phil., vi, 23, pl. iv, f. 2, *Catocala*.
1874. Strk., Lep. Rhop. et Het., 75, pr. syn.

HABITAT.—Middle and Central States.

C. judith Strk.*

1874. Strk., Lep. Rhop. et Het., 95, pl. xi, f. 5, *Catocala*.
1884. Hulst, Bull. Bkln. Ent. Soc., vii, 52, *Catocala*.
levettei Grt.
1874. Grt., Trans. Am. Ent. Soc., v, 95, *Catocala*.
1875. Strk., Lep. Rhop. et Het., 105, pr. syn.
1880. Hulst, Bull. Bkln. Ent. Soc., iii, 8, 12, pr. syn.
1881. Grt., Papilio, i, 160, *Catocala*.

1881. Hulst, Papilio, I, 218, pr. syn.
var. **miranda** Hy. Edw.
1881. Hy. Edw., Papilio, I, 118, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 52, pr. var.

HABITAT.—Eastern, Middle and Central States.

The type of *miranda* is in the Edwards collection.

C. robinsonii Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 20, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 71, pl. IX, f. 1, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 52, *Catabapta.*
var. **curvata** French.
1881. French, Papilio, 1, 218, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 52, pr. syn.

HABITAT.—Eastern, Middle and Central States; New York; Illinois; Mississippi.

C. dejecta Strk.

1880. Strk., Bull. Bkln. Ent. Soc., II, 97, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 52, *Catabapta.*

HABITAT.—Eastern, Middle and Central States.

C. retecta Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 4, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 71, pl. IX, f. 2, *Catocala.*
1881. Kellicott, Papilio, I, 141, larva sub nom. *flebilis.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 53, *Catabapta.*
1886. Kellicott, Ent. Amer., II, 46, larva.
var. **flebilis** Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 4, *Catocala.*
1874. Strk., Lep. Rhop. et Het., 71, pl. IX, f. 3 & 4, *Catocala.*
1876. Grt., Can. Ent., VIII, 229, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 53, pr. syn.
1891. Grt., Can. Ent., XXIII, 281, *Catocala.*

HABITAT.—Canada; Northern, Eastern, Middle, and Central States. August and September.

C. luctuosa Hulst.

1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 53, *Catabapta.*

HABITAT.—Middle and Western States.

C. vidua S. & A.*

1797. S. & A., Ins. Ga., II, 181, pl. 91, *Phalæna.*
1811. Oliv., Enc. Meth., VIII, 288, *Noctua.*
1872. Grt., Trans. Am. Ent. Soc., IV, 3, *Catocala.*
1884. Hulst, Bull, Bkln. Ent. Soc. VII, 53, *Catabapta.*
desperata Gn.
1852. Gn., Spec. Gen., Noct. III, 95, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1201, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 3, ? pr. syn.
1873. Strk., Lep. Rhop. et Het., 33, pl. V. f. 2, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 12, pr. syn.

1882. Grt., New List, 65, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 53, pr. syn.
1888. French, Can. Ent., XX, 28, *Catocala.*

HABITAT.—Canada to Florida; Central States. August and September.

C. **maestosa** Hulst.*

1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 53, *Catobapta.*
vidua et viduata ‡ Gn.
1852. Gn., Spec. Gen., Noct., III, 94 et 400, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 3, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 17, pl. III, 2, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 12, *Catocala.*
1882. Grt., New List, 65, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 53, pr. syn.
guenеei Grt.
1887. Grt., Can. Ent. XIX, 115, *Catocala.*

HABITAT.—Pennsylvania, southward; Central States.

C. **lacrymosa** Gn.*

1852. Gn., Spec. Gen., Noct., III, 93, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1199, ?=*vidua.*
1872. Grt., Trans. Am. Ent. Soc., IV, 9, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 18, pl. III, f. 3, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 54, *Catabapta.*
var. **ulalume** Strk.
1877. Strk., Lep. Rhop. et Het., 132, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 54, pr. syn.
var. **evelina** French.
1881. French, Papilio, I, 110, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 54, pr. var.
emilia Hy. Edw.
1881. Hy. Edw., Papilio, I, 117, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 54,=*evelina.*
var. **zelica** French.
1881. French, Papilio, I, 111, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 54, pr. var.
var. **paulina** Hy. Edw.
1880. Hy. Edw., Bull. Bkln. Ent. Soc., III, 54, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 54, pr. var.

HABITAT.—New York to Texas; Ohio; Illinois; Southern States.

C. **sappho** Strk.*

1874. Strk., Lep. Rhop. et Het., 95, pl. XI, f. 4, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 13, *Catocala.*
1881. French, Papilio, I, 57, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 54, *Catabapta.*
1886. French, Can. Ent., XVIII, 162, *Catocala.*

HABITAT.—Illinois; Texas; Central and Southern States.

C. **agrippina** Strk.*

1874. Strk., Lep. Rhop. et Het., 95, pl. XI, f. 1, 3, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 55, *Catabapta.*

var. **subviridis** Harv.
1877. Harv., Can. Ent., IX, 193, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 13, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 55, pr. var.

HABITAT.—Middle and Southern States to Texas; Texas in July.

C. insolabilis Gn.*

1852. Gn., Spec. Gen., Noct., III, 94, *Catocala.*
1857. Wlk., C. B. Mus., Het., XIII, 1200, *Catocala.*
1872. Grt., Trans. Am. Ent. Soc., IV, 3, *Catocala.*
1873. Strk., Lep. Rhop. et Het., 33, pl. V, f. 1, *Catocala.*
1875. Grt., Bull. Buff. Soc. Nat, Sci., III, 187, pl. V, f. 3, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 13, *Catocala.*
1884. Angus, Papilio, IV, 35, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 55, *Catabapta.*

HABITAT.—Canada in June; Middle, Central, and Southern States, August and September.

C. angusi Grt.*

1876. Grt., Can. Ent., VIII, 229, *Catocala.*
1877. Grt., Bull. Buff. Soc. Nat. Sci., III, 188, pl. 5, f. 1 and 2, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 13, an var. *insolabilis.*
1884. Angus, Papilio, IV, 35, an sp. dist.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 55, an sp. dist.
var. **lucetta** Hy. Edw.
1882. Hy. Edw., in French, Cat. Ills., 4, pr. var.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 55, pr. syn.

HABITAT.—Middle, Central, and Southern States.

The type of *angusi* is in the American Museum of Natural History, from the Angus Collection.

C. obscura Strk.*

1873. Strk., Lep. Rhop. et Het., 19, pl. III, f. 4, *Catocala.*
1884. Angus, Papilio, IV, 37, *Catocala.*
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 32, 55, *Catabapta.*
1886. Kellicott, Ent. Amer., II, 46, larva.
simulatilis Grt.
1874. Grt., Trans. Am. Ent. Soc., V, 95, *Catocala.*
1875. Strk., Lep. Rhop. et Het., 106, pr. syn.
1876. Grt., Can. Ent., VIII, 229, an sp. dist.
1882. Grt., Papilio, II, 8, an var. pr.
1884. Angus, Papilio, IV, 37, pr. syn.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 55, pr. syn.
var. **residua** Grt.
1874. Grt., Proc. Bost. Soc. N. H., XVI, 242, *Catocala.*
1875. Strk., Lep. Rhop. et Het., 106, an var. *insolabilis.*
1877. Grt., Bull. Buff. Soc. Nat. Sci., III, pl. 5, f. 4, *Catocala.*
1877. Harv., Can. Ent., IX, 194, *Catocala.*
1880. Hulst, Bull. Bkln. Ent. Soc., III, 13, an var. *insolabilis.*
1884. Angus, Papilio, IV, 35, an sp. dist.
1884. Hulst, Bull. Bkln. Ent. Soc., VII, 55, pr. var.

HABITAT.—Canada to Middle and Central States in August; Colorado.

The type of *residua* is in the American Museum of Natural History from the Angus Collection.

Catocala adultera Hinze, recorded by Motschulsky in his Etudes, 1857, p. 47, as from California, has been omitted for want of proper authentication. It is likely that one of the common Pacific slope species resembling *adultera* somewhat, was mistaken for it.

Genus **OPHIDERES** Bdv.

1834. Bdv., Fn. Ent. Madag., Lep., 99.

O. materna Linn.*

1767. Linn., Syst. Nat., ed. XII, 2, p. 840, *Noctua*.
1773. Drury, Illustr., II, 24, pl. 13, f. 4, *Noctua*.
1779. Cram., Pap. Exot., II, 118, pl. 174, f. *B*, *Phalæna*.
1781. Fabr., Spec. Ins., II, 212, *Noctua*.
1782. Cram., Pap. Exot., III, 137, pl. 267, f. *E*, *Phalæna*.
1787. Fabr., Mant. Ins., II, 137, *Noctua*.
1788. Gmel., ed. Linn., Syst. Nat., V, p. 2533, *Noctua*.
1793. Fabr., Ent. Syst., III, 2, 16, *Noctua*.
1811. Oliv., Enc. Meth., VIII, 259, *Noctua*.
1816. Hbn., Verzeichniss, 264, *Rhytia*.
1834. Bdv., Fn. Ent. Madag., 100, *Ophideres*.
1841. Duncan, in Jardine, Nat. Libr., XXXII, 201, pl. 35, f. 2, *Triphæna*.
1852. Gn., Spec. Gen., Noct., III, 113, *Ophideres*.
1856. Lucas, in Sagra's Cuba, 307, *Ophideres*.
1857. Wlk., C. B. Mus., Het., XIII, 1222, *Ophideres*.
1868. H. Sch., Corr. Blatt, 1868, Cuba, 23, *Ophideres*.
1875. Grt., Proc. Bost. Soc. N. H., XVIII, 416, *Ophideres*.
1885. Gundlach, Cont. Ent. Cub., 340, *Ophideres*.
hybrida Fabr.
1775. Fabr., Syst. Ent., 593, *Noctua*.
1781. Fabr., Spec. Ins., II, 212, pr. syn.
calaminea Cram.
1779. Cram., Pap. Exot., II, 95, pl. 74, f. *A*, *Phalæna*.
1781. Fabr., Spec. Ins., II, 212, pr. syn.

HABITAT.—Florida, southward.

A tropical insect in habitus and form. The literature as a South and Central American insect is not given.

Genus **STRENOLOMA** Grt.

1880. Grt., No. Amer. Ent., I, 97.

S. lunilinea Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 127, *Spiloloma*.
1880. Grt., No. Amer. Ent., I, 97, *Strenoloma*.
1882. Grt., Ill. Essay, 71, pl. IV, f. 45, *Strenoloma*.

HABITAT.—Pennsylvania; Virginia; Kansas; Illinois; Mississippi; District of Columbia in August.

The type is in the British Museum.

Genus **TOXOCAMPA** Gn.

1841. Gn., Ann. Soc. Ent. Fr., X, 75.

T. victoria Grt.,*

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 163, *Toxocampa.*
1880. Grt., Bull. Bkln. Ent. Soc., III, 48, *Toxocampa.*

HABITAT.—Victoria; New York; Colorado in August; New Mexico.

The type is in the British Museum.

Genus **HOMOPHOBERIA** Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 125.

H. cristata Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 125, *Homophoberia.*

HABITAT.—Hoboken, New Jersey.

The species was described from the Sachs collection, and seems to be one of those unfortunate Hoboken forms that have not turned up again since their original description. I have no idea where the type is at present.

Genus **PHOBERIA** Hbn.

1816. Hbn., Verzeichniss, 267.

P. atomaris Hbn.*

1818. Hbn., Zuträge, I, 16, ff. 75, 76, *Phoberia.*
1816. Hbn., Verzeichniss, 268, *Phoberia.*
1858. Wlk., C. B. Mus., Het., XIV, 1421, ? *Ophiusa.*
1880. Grt., Can. Ent., XII, 86, *Poaphila.*
orthosioides Gn.
1852. Gn., Spec. Gen., Noct., III, 296, pl. 23, f. 1, *Lyssia.*
1858. Wlk., C. B. Mus., Het., XIV, 1421, pr. syn.
1880. Grt., Can. Ent., XII, 86, pr. syn.
forrigens Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1474, *Poaphila.*
ingenua Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1472, *Poaphila.*

HABITAT.—Eastern, Middle, Central, and Southern States; Massachusetts and New York in April and May; Texas in March.

Types of the Guenée and Walker species are in the British Museum, and are all more or less distinctly marked specimens of our common species.

P. indiscreta Hy. Edw.

1886. Hy. Edw., Ent. Amer., II, 170, *Phoberia.*

HABITAT.—Kern County, California.

The type is in the Edwards collection. There may be some doubt of the correctness of the generic reference.

Genus **CELIPTERA** Gn.

1852. Gn., Spec. Gen., Noct., III, 308.

C. frustulum Gn.*

1852. Gn., Spec. Gen., Noct., III, 308, *Celiptera.*
1858. Wlk., C. B. Mus., Het., XIV, 1487, *Celiptera.*

discissa Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 1009, *Remigia*.
1868. G. & R., Trans. Am. Ent. Soc., II, 88, = *L. elongatus*.
elongatus Grt.
1865. Grt., Proc. Ent. Soc. Phil., III, 85, pl. 2, f. 6, *Litomitus*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 39, pr. syn.

HABITAT.—Canada; Eastern, Middle, Central, and Southern States; District of Columbia in August; Delaware in July.

Guenée's type is with M. Oberthür. The type of *discissa* is in the British Museum. Mr. Grote's type I have not seen.

C. bucetum Grt.

1883. Grt., Trans. Kans. Ac. Sci., VIII, 50, *Celiptera*.

HABITAT.—New Mexico.

The type is with Prof. Snow.

Genus FAGITANA Wlk.

1865. Wlk., C. B. Mus., Het., XXXII, 645.

F. littera Gn.*

1852. Gn., Spec. Gen., Noct., I, 71, *Leucania*.
1856. Wlk., C. B. Mus., Het., IX, 77, *Mythimna*.
1882. Grt., Ill., Essay, 41, *Pseudolimacodes*.
lucidata Wlk.
1865. Wlk., C. B. Mus., Het., XXXII, 645, *Fagitana*.
niveicostatus Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 212, *Pseudolimacodes*.
1875. Grt., Stett. Ent. Zeit., XXXVI, 199, *Pseudolimacodes*.
1882. Grt., Ill. Essay, 41, pr. syn.

HABITAT.—New York; Massachusetts in July; Florida; Illinois.

The Guenée and Walker types are in the British Museum. Mr. Grote's type I have not seen; but have seen a number of specimens named by him. Walker's species was described without locality and in such a way as to be not readily recognizable. As *Fagitana* has only the one species, it must be used in preference to Mr. Grote's generic term, under the rules. On the location of the genus I express no opinion. Guenée considers it Leucaniid. Mr. Grote places it in its present position on characters that seem valid to him.

Genus PHURYS Gn.

1852. Gn., Spec. Gen., Noct., III, 303.

The genera in this series need revision. The differences between *Celiptera*, *Phurys*, and some species of *Poaphila* are difficult to make out; but I have in most cases left matters as they were, since any changes here could be only tentative and liable to further change on critical study. There are, also, a number of Verzeichniss genera that have not been applied, and which will probably have to be used to replace one or more of the terms adopted here. They are all indicated in the synonymy. The specific unions are all correct I believe.

P. vinculum Gn.*

1852. Gn., Spec. Gen., Noct., III, 304, *Phurys*.
1858. Wlk., C. B. Mus., Het., XIV, 1479, *Phurys*.

HABITAT.—Georgia; Florida; Southern States.

The type is with M. Oberthür.

P. herbarum Gn.

1852. Gn., Spec. Gen., Noct., III, 303, *Poaphila*.
1858. Wlk., C. B. Mus., Het., XIV, 1471, *Poaphila*.
bifasciata Bates.
1886. Bates, Can. Ent., XVIII, 94, *Celiptera*.
1888. Bates, Can. Ent., XX, 100, = *vinculum*.

HABITAT.—Southern States.

The type is with M. Oberthür. In the British Museum are specimens of both the above species, apparently named by Guenée and agreeing with his description. They are closely allied; but in *vinculum* the orbicular is present and the subterminal dotted line is distinct. The *vinculum* of the Grote collection and of American collections generally is the *herbarum* of Guenée according to these specimens, and I have accordingly cited *bifasciata* Bates to this species. Mr. Bates referred his species to *vinculum* on my authority, and what I knew as *vinculum* was what Mr. Grote had so named.

P. ovalis Grt.

1883. Grt., Papilio, III, 75, *Phurys*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

P. lima Gn.*

1852. Gn., Spec. Gen., Noct., III, 305, *Phurys*.
1858. Wlk., C. B. Mus., Het., XIV, 1479, *Phurys*.
obversa Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1473, *Poaphila*.
dissocians Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1477, *Poaphila*.

HABITAT.—Southern States; New York.

Guenées type is with M. Oberthür. The specimens in the Grote collection agree with those so named in the British Museum, apparently by Guenée. The Walker types are both in the Museum and are like the Grote specimens of *lima*: *dissocians* was described without locality.

P. bistrigata Hbn.

1818. Hbn., Zutræge, I, 21, f. 111, 112, *Ptichodes*.
1816. Hbn., Verzeichniss, 338, *Ortholitha*.
1852. Gn., Spec. Gen., Noct., III, 303, *Poaphila*.
1858. Wlk., C. B. Mus., Het., XIV, 1471, *Poaphila*.
1880. Grt., Can. Ent., XII, 87, *Poaphila*.
1882. Grt., New List, 41, *Phurys*.

HABITAT.—Georgia.

I am not aware that this species has been positively identified in American collections. I have not seen it myself.

P. perspicua Wlk.*

1858. Wlk., C. B. Mus., Het., xiv, [illegible], *[illegible]*
[illegible] Grt.
1875. Grt., Proc. Bost. Soc. N. H., xvii, [illegible], *Phurys.*

HABITAT.—Florida.

The types are in the British Museum, and refer to one species only. *Perspicua* was described from locality unknown; but the specimen is probably from Doubleday's Florida material.

Genus POAPHILA Gn.

1852. Gn., Spec. Gen., Noct., iii, 299.

P. quadrifilaris Hbn.*

1823. Hbn., Zutrage, iii, 27, f. 569, 570, *Agnomonia.*
1852. Gn., Spec. Gen., Noct., iii, 300, *Poaphila.*
1858. Wlk., C. B. Mus., Het., xiv, 1469, *Poaphila.*
1880. Grt., Can. Ent., xii, 118, *Poaphila.*

HABITAT.—New York in May and June, southward to Florida; Massachusetts in June.

P. deleta Gn.*

1852. Gn., Spec. Gen., Noct., iii, 300, *Poaphila.*
1858. Wlk., C. B. Mus., Het., xiv, 1469, *Poaphila.*
obsoleta Grt.
1876. Grt., Check List, Noct., 42, *Poaphila 4-filaris var.*
1882. Grt., New List, 41, sp. dist.

HABITAT.—Southern States.

Types of Guenée's species are in both the London and Paris Museums, and are like the type of *obsoleta* in the British Museum. Mr. Grote based his name *obsoleta* on what he identified as Guenée's var. *a*, of *P. quadrifillaris*, and misidentified *deleta*. The *deleta* of the Grote collection is the *contempta* Bdv., as identified by Guenée. It is probable that this error is repeated in all the American collections deriving their determinations through Mr. Grote.

P. contempta Bdv.

1852. Bdv., in Gn., Spec. Gen., Noct., iii, 302, *Poaphila.*
1858. Wlk., C. B. Mus., Het., xiv, 1470, *Poaphila.*

HABITAT.—Georgia; Florida; Southern States.

The type is with Mr. Oberthür. As already stated, this is the *deleta* of the Grote collection.

P. sylvarum Gn.*

1852. Gn., Spec. Gen., Noct., iii, 300, pl. xxiii, f. 2, *Poaphila.*
1858. Wlk., C. B. Mus., Het., xiv, 1469, *Poaphila.*

HABITAT.—Southern States.

The types were from the Boisduval collection and are probably with

M. Oberthür. A specimen, apparently determined by Guenée, is in the British Museum, and this agrees with the specimens so named in the Grote collection.

P. erasa Gn.

1852. Gn., Spec. Gen., Noct., III, 301, *Poaphila.*
1858. Wlk., C. B. Mus., Het., XIV, 1470, *Poaphila.*

HABITAT.—Southern States.

Typical specimens, named by Guenée, are in the British Museum and in the Jardin des Plantes, and with these the *erasa* of the Grote collection agrees; but the *herbicola* of the same collection is also *erasa*, and not the *herbicola* Bdv.

P. herbicola Bdv.*

1852. Gn., Spec. Gen., Noct., III, 301, *Poaphila.*
1857. Wlk., C. B. Mus., Het., XIV, 1417, *Poaphila.*

HABITAT.—Southern States.

The type is probably in the Oberthür collection. In the Jardin des Plantes at Paris is a specimen named *herbicola* by Guenée, which is very like *erasa* in habitus and maculation and seems to differ only in the much paler ground color. It is much paler than the *herbicola* of the Grote collection; but it is not at all unlikely that intermediate specimens will be found and that *herbicola* is a washed-out *erasa.*

P. flavistriaria Hbn.

1823. Hbn., Zutræge, III, f. 555, 556, *Crochiphora.*
1852. Gn., Spec. Gen., Noct., III, 303, *Poaphila.*
1858. Wlk., C. B. Mus., Het., XIV, 1470, *Poaphila.*
1880. Grt., Can. Ent., XII, 118, *Poaphila.*

HABITAT.—Southern States.

P. pacalis Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1475, *Poaphila.*
irrorata Grt.
1878. Grt., Bull. Geol. Surv., IV, 185, *Poaphila.*

HABITAT.—Florida.

The types are both in the British Museum, and are undoubtedly the same, specifically.

P. placata Grt.

1878. Grt., Bull. Geol. Surv., IV, 184, *Poaphila.*

HABITAT.—Georgia.

I have not seen the type, nor do I know where it is.

P. perplexa Bdv.

1852. Bdv., in Gn., Spec. Gen., Noct., III, 302, *Poaphila.*
1858. Wlk., C. B. Mus., Het., XIV, 1470, *Poaphila.*

HABITAT.—Georgia.

A type specimen is in the Paris Museum. It is a *Phurys*, allied to *herbarum*, with the t. a. line and subterminal spots wanting. I am not certain that I have seen just this form in American collections.

P. revoluta Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1472, 1835, *Poaphila.*

HABITAT.—United States.

The type is not in the British Museum, or at all events I failed to find it. The label is there; but no specimen. It is probably at Oxford, in the Saunders collection.

P. turbata Wlk.

1858. Wlk., C. B. Mus., Het., XIV, 1834, *Poaphila.*

HABITAT.—East Florida.

The type in the British Museum is a poor, faded specimen of a *Perigea.* There is a whitish powdered reniform and a punctiform white t. p. line. It looks familiar enough, yet I felt afraid to identify it with any of the species in the Museum Collection, and am not positive that it can ever be certainly identified.

Genus **PARALLELIA** Hbn.

1816. Hbn., Verzeichniss, 269.

P. bistriaris Hbn.*

1818. Hbn., Zutræge, 1, 15, f. 63, 64, *Parallelia.*
1816. Hbn., Verzeichniss, 269, *Parallelia.*
1852. Gn., Spec. Gen., Noct., III, 268, *Ophiusa.*
1858. Wlk., C. B. Mus., Het., XIV, 1420, *Ophiusa.*
1870. Saund., Can. Ent., II, 130, larva.
1880. Grt., Can. Ent., XII, 86, *Parallelia.*
1883. Hy. Edw., Papilio, III, 136, larva.
amplissima Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1473, *Poaphila.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.

HABITAT.—Nova Scotia to Florida, west to Colorado; Canada, June and July; New York, June to August; New Jersey, May and June; District of Columbia in May; Kansas in May.

The Walker type is in the British Museum.

Genus **AGNOMONIA** Hbn.

1823. Hbn., Zutraege, III, 10.

A. anilis Dru.*

1797. Drury, Illustr., II, 21, pl. 12, f. 3, *Noctua.*
1816. Hbn., Verzeichniss, 252, *Argyrostrotis.*
1852. Gn., Spec. Gen., Noct., III, 273, *Agnomonia.*
1858. Wlk., C. B. Mus., Het., XIV, 1437, *Agnomonia.*
sesquistriaris Hbn.
1823. Hbn., Zutræge, III, 10, f. 419, 420, *Agnomonia.*
1852. Gn., Spec. Gen., Noct., III, 273, pr. syn.

HABITAT.—Middle and Southern states; Texas, April to June; Missouri in August.

Genus **PALINDIA** Gn.

1852. Gn., Spec. Gen., Noct., ii, 274.

P. dominicata Gn.

1852. Gn., Spec. Gen., Noct., ii, 276, pl. xi, f. 1, *Palindia.*
1857. Wlk., C. B. Mus., Het., xii, 846 *Palindia.*
1879. Grt., No. Amer. Ent., i, 13, *Palindia.*

HABITAT.—Texas; South America.

I do not know where the type is at present.

Genus **SIAVANA** Wlk.

1857. Wlk., C. B. Mus., Het., xiii, 1009,

S. repanda Wlk.*

1858. Wlk., C. B. Mus., Het., xiii, 1009, *Siarana.*
auripennis Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 126, *Harreya.*

HABITAT.—Southern States; Kentucky; Florida.

The Walker type is in the British Museum. The Grote type I have not seen, the specimen in the British Museum not being such. Mr. Grote for some reason never listed this Walker species, though Florida is given as the locality and the description is not entirely inapplicable.

Genus **PANAPODA** Gn.

1852. Gn., Spec. Gen., Noct., iii, 324.

P. rufimargo Hbn.*

1818. Hbn., Zuträge, i, 13, ff. 45, 46, *Phoberia.*
1852. Gn., Spec. Gen., Noct., iii, 324, *Panapoda.*
1858. Wlk., C. B. Mus., Het., xiv, 1517, *Panapoda.*
1878. Grt., Bull. Geol. Surv., iv, 184, *Panapoda.*
1880. Grt., Can. Ent., xii, 85, *Panapoda.*
1892. Beut., Bull. Am. Mus. N. H., iv. 69, larva.
rubricosta Gn.
1852. Gn., Spec. Gen., Noct., iii, 324. *Panapoda.*
1858. Wlk., C. B. Mus., Het., xiv, 1517, *Panapoda.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 44, pr. syn.
1876. Grt., Check List Noct., 42, pr. syn.
1878. Grt., Bull. Geol. Surv., iv, 184, pr. syn.
1880. Grt., Can. Ent., xii, 85, pr. syn.
cressonii Grt.
1863. Grt., Proc. Ent. Soc. Phil., i, 346, pl. iii, f. 4, *Panapoda.*
1865. Wlk., C. B. Mus., Het., xxxiii, 1021,? pr. syn.
1874. Grt., Bull. Buff. Soc. Nat. Sci., ii, 44, pr. syn.
4878. Grt., Bull. Geol. Surv., iv, 184, pr. syn.
1880. Grt., Can. Ent., xii, 85, pr. syn.
var. **carneicosta** Gn.*
1852. Gn., Spec. Gen., Noct., iii, 325, *Panapoda.*
1858. Wlk., C. B. Mus., Het., xiv, 1517, *Panapoda.*
1891. Smith, List Lepid., 61, pr. var.
1892. Beut., Bull. Am. Mus. N. H., iv, 68, larva.
scissa Wlk.
1865. Wlk., C. B. Mus., Het., xxxiii, 987, *Poaphila.*

1868. G. & R., Trans. Am. Ent. Soc., II, 88, *carneicosta.*
combinata Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1436, *Ophiusa.*
var. **roseicosta** Gn.
1852. Gn., Spec. Gen., Noct., III, 325, *Panapoda.*
1858. Wlk., C. B. Mus., Het., XIV, 1517, *Panapoda.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 44, pr. syn.
1878. Grt., Bull. Geol. Surv., IV, 184, pr. syn.
1880. Grt., Can. Ent., XII, 85, pr. syn.
1882. Grt., New List, 41, pr. var.
1889. Soule & Eliot, Psyche, V, 259, larva.

HABITAT.—Middle, Southern, and Central States, June to August; Texas, in March, April, and August.

The type of *rubricosta* is probably with M. Oberthür. I have not seen it. The type of *cressoni* I have not seen. nor do I know of its present whereabouts. The type of *carneicosta* is in the Jardin des Plantes, where I have seen it. It is the form in which the ordinary spots are black and distinct. The Walker types are in the British Museum and are both referable here. *Roseicosta* Gn., was described after a drawing by Abbot, and Guenée himself suspected its identity with *rubricosta.* I have not seen this figure, but do not doubt that the species belongs here.

Genus **PLEONECTYPTERA** Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 23.

P. pyralis Hbn.*

1818. Hbn., Zuträge, I, 23, f. 127, 128, *Hemeroplanis.*
1872. Grt., Trans. Am. Ent. Soc., IV, 23, *Pleonectyptera.*
1880. Grt., Can. Ent., XII, 87, *Pleonectyptera.*
irrecta Wlk.
1865. Wlk., C. B. Mus., Het., XXXIV, 993, *Poaphila.*
floccalis Zell.
1872. Zell., Verh. k. k. zoöl. bot. Ges., XXII, 476, t. I, f. 10, *Coptocnemia.*
1891. Smith, List Lepidoptera, 61, pr. syn.

HABITAT.—Middle, Southern and Central States; Texas.

The type of *irrecta* is in the British Museum. *Pyralis* Hbn., is the form with a rusty maculation on a bright yellow ground. The type of *floccalis* is in the Museum at Cambridge, where I have compared it with normal *pyralis.* Mr. Grote's genus has priority by two or three months, but the characterization fails to call attention to the interesting leg structure figured by Zeller.

P. geometralis Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 24, *Pleonectyptera.*

HABITAT.—Alabama; Southern States; Florida in March.

The type is in the American Entomological Society's collection. The species is exactly like *pyralis* in maculation, but the bright yellow is replaced by a uniform rusty brown. But even in the type a yellowish suffusion is perceptible, and I am convinced that we have to do with forms of one species only.

P. habitalis Wlk.

1859. Wlk., C. B. Mus., Het., XVI, 39, *Hypena*.
phalænalis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 24, *Pleonectyptera*.

HABITAT.—Alabama; Southern States.

Walker's type is in the British Museum; that of the Grote species is in the collection of the American Entomological Society. I have a specimen which has been compared with both types and agrees well with each of them. For a change, Mr. Grote's type is much the poorest and least recognizable.

P. historialis Grt.

1882. Grt., Can. Ent., XIV, 188, *Pleonectyptera*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

P. immaculalis Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 13, *Pleonectyptera*.

HABITAT.—Texas, in March, April, and July.

The type is in the British Museum.

P. obliqualis Hy. Edw.*

1886. Hy. Edw., Ent. Amer., II, 171, *Pleonectyptera*.

HABITAT.—Texas.

The type is in the Edwards collection.

P. incusalis Grt.

1881. Grt., Can. Ent., XIII, 133, *Bomolocha*.

HABITAT.—Colorado; Arizona.

Types are in the British Museum and in the Edwards collection. I have seen both, and have a carefully compared specimen. I can not understand the reference to *Bomolocha*, with which the species has nothing in common.

P. subflavidalis Grt.

1881. Grt., Papilio, I, 166, *Megachyta*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen and is undoubtedly a *Pleonectyptera*.

Genus **REMIGIA** Gn.

1852. Gn., Spec. Gen., Noct., III, 313.

R. latipes Gn.*

1852. Gn., Spec. Gen., Noct., III, 314, *Remigia*.
1858. Wlk., C. B. Mus., Het., XIV, 1494, *Remigia*.
1869. Bethune, Can. Ent., I, 88, *Remigia*.
1869. H. Sch., Corr. Blatt, 1869, Cuba, 28, *Remigia*.
1885. Gundlach, Cont. Ent. Cub., 354, *Remigia*.
repanda‡ Bdv.
1834. Bdv., Fn. Ent. Madag., 107, 12, pl. XIII, f. 3, *Ophiusa*.

1852. Gn. Spec. Gen., Noct., III, 314, pr. syn.
punctularis ‡ Bdv.
1840. Bdv., Ind. Meth., 107, *Ophiusa*.
1852. Gn., Spec. Gen., Noct., III, 314, pr. syn.
perlata Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1480, *Phurys*.
indentata Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 282, *Remigia*.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 12, ? pr. var.
texana Morr.
1874. Morr., Proc. Bost., Soc. N. H., XVII, 219, ? pr. var.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 12, pr. syn.
1875. Morr., Proc. Ac. Nat. Sci. Phil., 1875, 71, an sp. dist.
disseverans Wlk.
1858. Wlk., C. B. Mus., Het., XIV, 1495, *Remigia*.
var. **marcida** Gn.*
1852. Gn., Spec. Gen., Noct., III, 317, *Remigia*.
1858. Wlk., C. B. Mus., Het., XIV, 1495, *Remigia*.
hexastylus Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 285, *Remigia*.

HABITAT.—Labrador to Florida, to Texas; east of the Rocky Mountains; Texas in March, September, October, November; Florida in August and March; Delaware in May.

A typical specimen of *latipes* is in the British Museum and is very nearly like the type of *indentata* Harv., which is in the same collection. The type of *Phurys perlata* is a better marked specimen of the same species, and the type of *disseverans* is the pale, almost immaculate form. The type of *hexastylus* Harvey is in the British Museum, and is exactly like the type of *marcida* in the Jardin des Plantes. It is a larger form of the ordinary species, I believe. The species, according to Guenée, is widely distributed on both sides of the equator.

Genus **TRAMA** Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 13.

T. detrahens Wlk.*

1858. Wlk., C. B. Mus., Het., XIV, 1834, *Poaphila*.
arrosa Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 13, *Trama*.

HABITAT.—Southern States; Florida in March; Texas in June and August; Mississippi.

The types are in the British Museum. The Walker type is a poor, worn example, but there is no doubt of its identity with Dr. Harvey's species.

T. hinna Geyer.*

1837. Geyer, Zutræge, V, 41, ff. 971, 972, *Acolasia*.
1852. Gn., Spec. Gen., Noct., III, 216, *Bendis*.
1858. Wlk., C. B. Mus., Het , XIV, 1339, *Bendis*.
1881. Grt., Can. Ent., XIII, 92, *Acolasia*.
1882. Grt., New List, 41, *Trama*.

HABITAT.—Georgia; Texas; Florida in March.

T. griseipennis Grt.

1882. Grt., Can. Ent., XIV, 183, *Trama*.

HABITAT.—Arizona.

The type is with Mr. Neumœgen.

Genus **EUTOREUMA** Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 21.

E. tenuis Grt. *

1872. Grt., Trans. Am. Ent. Soc., IV, 22, *Eutoreuma*.

HABITAT.—District of Columbia, in June and August; Alabama; Southern States; Texas, in August.

♂ and ♀ specimens, labelled "type," are in the collection of the American Entomological Society, and a "type" is also in the British Museum.

Genus **ISOGONA** Gn.
1852. Gn., Spec. Gen., Noct., III, 322.

I. natatrix Gn.

1852. Gn., Spec. Gen., Noct., III, 323, *Isogona*.
1858. Wlk., C. B. Mus., Het., XIV, 1516, *Isogona*.

HABITAT.—North America.

The type is probably with M. Oberthür. So far as I am aware this species has not been identified in American collections. I have made no effort to apply the description, which seems to indicate an easily recognizable form.

Genus **CAPNODES** Gn.
1852. Gn., Spec. Gen., Noct., III, 374.

C. californica Behr.

1870. Behr, Trans. Am. Ent. Soc., III, 23, *Capnodes*.

HABITAT.—California.

I have not seen this species, and have not at present any idea what it can be.

Genus **ANTICARSIA** Hbn.
1816. Hbn., Verzeichniss, 340.

A. gemmatilis Hbn. *

1818. Hbn., Zutræge, I, 26, f. 153, 154, *Anticarsia*.
1816. Hbn., Verzeichniss, 340, *Anticarsia*.
1852. Gn., Spec. Gen., Noct., III, 355, *Thermesia*.
1858. Wlk., C. B. Mus., Het., XIV, 1560, *Thermesia*.
1879. Grt., Can. Ent., XI, 179, *Anticarsia*—varieties.
1880. Grt., No. Amer. Ent., I, 103, varieties, *Anticarsia*.
1880. Grt., Can. Ent., XII, 86, *Anticarsia*.

HABITAT.—Wisconsin; Texas, in October; Central and Southern States.

A good series of specimens is in the British Museum.

Genus **ANTIBLEMMA** Hbn.

1816. Hbn., Verzeichniss, 341.

A. inexacta Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIII, 1038, *Thermesia*.
canalis Grt.
1874. Grt., Bull. Bkln. Ent. Soc., II, 76, *Antiblemma*.
1878. Grt., Bull. Geol. Surv., IV, 185, *Antiblemma*.

HABITAT.—New York; Middle, Central, and Southern States.

The types are both in the British Museum.

A. guttula Hy. Edw.

1882. Hy. Edw., Papilio, II, 129, *Antiblemma*.

HABITAT.—Georgia.

The type is in the Edwards collection.

Genus **AGASSIZIA** Behr.

1870. Behr, Trans. Am. Ent. Soc., III, 23.

A. urbicola Behr.

1870. Behr, Trans. Am. Ent. Soc., III, 23, *Agassizia*.

HABITAT.—California.

I have seen no authentically named specimen of this species. Mr. Edwards told me, some years ago, that Dr. Behr had described a species of *Homopyralis* under the above name, but he was unwilling to make any positive statements in the matter.

Genus **EREBUS** Latr.

1810. Latr., Consid. gen. des Ins. et Crust., 365.

E. odora Linn.*

1758. Linn., Syst. Nat., ed. x, 505, *Bombyx*.
1764. Linn., Mus. Lud. Ulr., 374, *Attacus*.
1764. Clk., Icones, t. 50, f. 1, *Phalæna*.
1767. Linn., Syst. Nat., ed. XII, II, 811, *Attacus*.
1770. Drury, Illustr., I, pl. III, f. 1, *Phalæna*.
1779. Cram., Pap. Exot., II, 111, t. 169, f. *A. B*, *Phalæna*.
1781. Fabr., Spec. Ins., II, 210, *Noctua*.
1787. Fabr., Mant. Ins., II, 135, *Noctua*.
1788. Gmel., ed. XIII, Linn. Syst. Nat., 2528, *Noctua*.
1794. Fabr., Ent. Syst., III, 2, 10, *Noctua*.
1805. Beauv., Ins. Afr. and Am., pl. XXIII, f. 1, *Noctua*.
1811. Oliv., Encycl. Meth., VIII, 252, pl. 84, f. 2, *Erebus*.
1816. Hbn., Samml. Ex. Schmett., II, pl. 419, *Otosema*.
1816. Hbn., Verzeichniss, 273, *Otosema*.
1837. Wetw., ed. Dru., I, 6, pl. III, f. 1, *Erebus*.
1852. Gn., Spec. Gen., Noct., III, 167, *Erebus*.
1856. Lucas, in Sagra's Cuba, 308, *Erebus*.
1858. Wlk., C. B. Mus., Het., XIV, 1290, *Erebus*.
1869. H. Sch., Corr. Blatt, 1869, Cuba, 30, *Erebus*.
1869. Bethune, Can. Ent., I, 88, *Erebus*.
1870. Behr, Trans. Am. Ent. Soc., III, 23, *Erebus*.

1885. Gundlach, Cont. Ent. Cub., 367, *Erebus*.
1887. Fernald, Ent. Amer., iii, 78, larva.
agarista Cram.
1779. Cram., Pap. Ex., ii, 15, t. 170, f. *A*, *B*, *Phalæna*.
1788. Gmel., ed. Linn. Syst. Nat., 2529, pr. syn.

HABITAT.—Canada to Florida; Colorado; California; usually in isolated specimens, and late in fall in the Northern States.

Genus **THYSANIA** Dalm.

1824. Dalman, Kongl. Vetensk. Acad. Handlingar, 1824, 407.

T. zenobia Cram.*

1779. Cram., Lep. Exot., ii, 27, pl. 115, ff. *A. B.*, *Bombix*.
1781. Fabr., Spec. Ins., ii, 209, *Noctua*.
1782. Drury Illustr., iii, 39, f. 1, 2, *Bombix*.
1787. Fabr., Mant. Ins., ii, 135, *Noctua*.
1788. Gmel., ed. xiii, Linn. Syst. Nat., 2529, *Noctua*.
1794. Fabr., Ent. Syst., iii, 2, 8, *Noctua*.
1811. Oliv., Enc. Meth., viii, 251, pl. 84, f. 1, *Noctua*.
1816. Hbn., Verzeichniss, 273, *Syrnia*.
1849. Westw., ed. Dru., iii, 53, pl. 39, ff. 1, 2, *Erebus*.
1852. Gn., Spec. Gen., Noct., iii, 163, *Thysania*.
1856. Lucas, in Sagra's Cuba, 308, *Thysania*.
1858. Wlk., C. B. Mus., Het., xiv, 1287, *Thysania*.
1869. H. Sch., Corr. Blatt, 1869, Cuba, 30, *Thysania*.
1885. Gundlach, Cont. Ent. Cub., 366, *Thysania*.

HABITAT.—Florida; Southern States; occasional northward; Colorado.

Letis specularis Hbn., is hardly a North American species. It may have been occasionally found on our shores or within our boundaries; but I do not believe it a native entitled to be listed as a member of our fauna.

Genus **ZALE** Hbn.

1816. Hbn., Verzeichniss, 275.

Z. horrida Hbn.*

1818. Hbn., Zutræge, i, 11, ff. 31, 32, *Zale*.
1816. Hbn., Verzeichniss, 275, *Zale*.
1858. Wlk., C. B. Mus., Het., xiv, 1457, ? *Drasteria*.
1880. Grt., Can. Ent., xii, 85, *Zale*.
calycanthata ‡ Wlk.
1857. Wlk., C. B. Mus., Het., xiii, 1054, *Homoptera*.
1865. Beth., Can. Journal, x, 251, *Homoptera*.
1868. G. & R., Trans. Am. Ent. Soc., ii, 79, pr. syn.
1880. Grt., Can. Ent., xii, 85, pr. syn.

HABITAT.—Northern States, May and June; Texas, March and August; United States east of the Plains.

The specimen of *calycanthata* labeled by Walker is still in the British Museum collection and is as above referred.

Genus **PHÆOCYMA** Hbn.

1816. Hbn., Verzeichniss, 275.

P. lunifera Hbn.

1818. Hbn., Zutræge, 19, f. 97, 98, *Phœocyma.*
1816. Hbn., Verzeichniss, 275, *Phœocyma.*
1852. Gn., Spec. Gen., Noct., III, 3, pl. 15, f. 9, *Phœocyma.*
1857. Wlk., C. B. Mus., Het., XIII, 1045, *Phœocyma.*
1865. Bethune, Canadian Journal, x, 249, *Phœocyma.*
1878. Grt., Bull. Geol. Surv., IV, 185, *Pheocyma.*
1880. Grt., Can. Ent., XII, 87, *Pheocyma.*
lineosa Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1056, *Homoptera.*
1865. Bethune, Canadian Journal, x, 259, *Homoptera.*

HABITAT.—New York to Texas, to Illinois; Middle, Central, and Southern States; Colorada; Kansas; Texas in August.

Walker's type is in the British Museum, and is the species identified, correctly I think, as *lunifera* by Mr. Grote.

P. umbrina Grt.

1883. Grt., Can. Ent., XV, 3, *Pheocyma.*
1883. Grt., Can. Ent., XV, 123, *Ypsia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

P. termina Grt.

1883. Grt., Can. Ent., XV, 129, *Pheocyma.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **HOMOPTERA** Bdv.

1829. Bdv., Icon. Regn. Anim.

H. lunata Dru.*

1770. Drury, Illustr., I, 40, pl. 20, f. 3, *Noctua.*
1782. Cram., Pap. Ex., IV., 38, pl. 308, f. C., *Phalæna.*
1830. Westw., ed. Dru., I, 37, pl. 20, f. 3, *Erebus.*
1852. Gn., Spec. Gen., Noct., III, 12, *Homoptera.*
1857. Wlk., C. B. Mus., Het., XIII, 1053, *Homoptera.*
1865. Bethune, Canadian Journal, x, 252, *Homoptera.*
1877. Bean, Can. Ent., IX, 174, 228, = *edusa.*
1882. French, Can. Ent., XIV, 131, life hist.
var. **edusa** Dru.*
1773. Drury, Illustr., II, pl. 24, f. 4, *Noctua.*
1830. Westw, ed. Drury, II, 46, pl. 24, f. 4, *Erebus.*
1852. Gn., Spec. Gen., Noct., III, 14, *Homoptera.*
1857. Wlk., C. B. Mus., Het., XIII, 1054, *Homoptera.*
1865. Bethune, Canadian Journal, x, 9, *Homoptera.*
1877. Bean, Can. Ent., IX, 174, 228, *Homoptera.*
1878. Lint., Ent. Cont., IV, 108, pr. syn.
putrescens Guer.
1829. Guer., Icon. Regne Anim., pl. 89, *Homoptera.*

1852. Gn., Spec. Gen., Noct., III, 14,=*edusa*, larva.
saundersii Beth.
1864. Beth., Proc. Ent. Soc., Phil., IV, 215, *Homoptera*.
1865. Beth., Canadian Journal, x, 257, *Homoptera*.
1877. Bean, Can. Ent., IX, 174, pr. syn.
1878. Lint., Ent. Cont., IV, 109,? pr. syn.
viridans Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1064, *Homoptera*.
quadriplagiata Wlk.
involuta Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1055, *Homoptera*.
1865. Bethune, Canadian Journal, x, 253, *Homoptera*.

HABITAT.—Canada, May, June, and September; Texas to California, May and June; August to November in northern and eastern range; Texas in March, May, and October; United States generally.

The Walker types are all in the British Museum and all refer to the *edusa* form, *viridans* representing the darker specimens. Walker cites to *viridans*, *H. viridus* Gn., III, 13, described from South America, and refers both with a question to *lunata* Cram. I have not seen Guenée's type, and therefore cite Walker's name only in the synonyms. I can not find any description of *H. quadriplagiata*, but there may be such.

H. nigricans Beth.

1864. Bethune, Proc. Ent. Soc., Phil., IV, 214, *Homoptera*.
1865. Bethune, Canadian Journal, x, 252, *Homoptera*.

HABITAT.—Canada, August; Middle and Northern States.

The type is probably with Dr. Bethune.

H. rosæ Behr.

1870. Grt., Trans. Am. Ent. Soc., III, 28, *Homoptera*.

HABITAT.—California.

I have not seen the type.

H. rubi Edw.*

1881. Hy. Edw., Papilio, I, 28, *Homoptera*.

HABITAT.—California; Arizona.

Types are in the Edwards collection.

H. minerea Gn.*

1852. Gn., Spec. Gen., Noct., III, 15, pl. 18, f. 6, *Homoptera*.
1857. Wlk., C. B. Mus., Het., XIII, 1054, *Homoptera*.
1865. Bethune, Canadian Journal, x, 254, *Homoptera*.
obliqua? Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1054, *Homoptera*.
1868. Grt. & Rob., Trans. Am. Ent. Soc., II, 79, pr. syn.

HABITAT.—Canada; North America in May and June; Middle, Central, and Southern States.

I have not seen the type which is in the Oberthür collection; but the figure is unmistakable. The specimen named *minerea* in the British

Museum is a small form of *lunata*, with much blue powdering. A specimen similar to it from Dr. Bailey, Center, N. Y., is in the Grote collection, without specific name.

H. calycanthata S. & A.*

1797. S. & A., Ins. Ga., II, 207, pl. 104, *Phalæna*.
1816. Hbn., Verzeichniss, 275, *Phæocyma*.
1852. Gn., Spec. Gen., Noct., III, 15, *Homoptera*.

HABITAT.—Canada in May; Massachusetts in May and June; Illinois in August; New York and southward to Florida and Texas; Portland, Oregon, April and May; Colorado.

H. cingulifera Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1056, *Homoptera*.
intenta Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1070, *Homoptera*.
woodii Grt.
1877. Grt., Can. Ent., IX, 88, *Homoptera*.

HABITAT.—Massachusetts in July; New York to Florida; Central States; Wisconsin.

The types of all the names are in the British Museum, and all refer to this one, very distinct species.

H. salicis Behr.

1872. Behr, Trans. Am. Ent. Soc., III, 28, *Homoptera*.

HABITAT.—California.

The type is probably with Dr. Behr. I do not know the species.

H. albofasciata Beth.

1865. Bethune, Canadian Journal, x, 256, *Homoptera*.

HABITAT.—Canada in May and June.

The type is probably with Dr. Bethune.

H. edusina Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 14, *Homoptera*.
atritincta Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 14, *Homoptera*.
1878. Grt., Bull. Geol. Surv., IV, 185, =♀ prec.

HABITAT.—Texas, February, March, and May.

The types are in the British Museum, and refer to one species without much doubt. I am not so sure that the differences between them are sexual; but believe that males and females of both forms occur,

H. galbanata Morr.

1875. Morr., Proc. Ac. Nat. Sci., Phil., 1875, 435, *Homoptera*.

HABITAT.—Nebraska.

I have no information concerning the type of this species.

H. uniformis Morr.

1875. Morr., Can. Ent., VII, 148, *Homoptera.*

HABITAT.—Georgia.

The type is in the Tepper collection.

H. cinerea Morr.

1875. Morr., Can. Ent., VII, 148, *Homoptera.*

HABITAT.—Massachusetts.

I have no information as to the type of this species.

H. penna Morr.

1875. Morr., Proc. Bost. Soc. N. H., XVIII, 241, *Homoptera.*
1878. Grt., Bull. Geol. Surv., IV, 185, *Pheocyma.*

HABITAT.—Illinois; Middle and Central States.

I have not seen the type.

H. unilineata Grt.*

1876. Grt., Can. Ent., VIII, 108, *Homoptera.*
1883. Grt., Can. Ent., XV, 123, *Homoptera.*

HABITAT.—Canada; Eastern, Middle and Central States, May; District of Columbia in April.

The type is in the British Museum.

H. obliqua Gn.*

1852. Gn., Spec. Gen., Noct., III, 16, pl. XV, f. 7, *Homoptera.*

HABITAT.—Middle, Eastern and Central States, May and June.

The type is probably with M. Oberthür. The British Museum specimen is a rubbed *lunata*, and does not agree with Guenée's figure. In the Grote collection there are specimens which are, I believe, correctly determined.

H. duplicata Beth.*

1856. Bethune, Canadian Journal, x, 257, *Homoptera.*

HABITAT.—Canada; Northern and Middle States; Washington in September.

The type is probably with Dr. Bethune.

H. benesignata Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., III, 14, *Homoptera.*

HABITAT.—Canada.

The type is in the British Museum.

H. declarans Wlk.

1857. Wlk., C. B. Mus., Het., XIII, 1057, *Homoptera.*

HABITAT.—"East Florida."

The type in the British Museum looks very much like a *Ph. lunifera*, with very pale ground color, distinct dark basal space, and black reniform. The two exterior lines are close together, distinct, the intervening space distinctly yellow. It is not in the Grote collection and seems a good species.

Genus CAMPOMETRA Gn.

1852. Gn., Spec. Gen., Noct., III, 25.

C. amella Gn.

1852. Gn., Spec. Gen., Noct., III, 25, pl. 18, f. 8, *Campometra*.
1857. Wlk., C. B. Mus., Het., XIII, 1084, *Campometra*.

HABITAT.—*Georgia*.

The type is with M. Oberthür. I am not aware that this species has been identified in American collections. The figure represents a very familiar-looking form; but I have not tried to apply it. In the Neumoegen collection Mr. Grote has suggested its identity with *Eubolina stylobata*, and perhaps that is correct.

Genus EUBOLINA Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 281.

E. impartialis Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 281, *Eubolina*.

HABITAT.—Texas in July.

The type is in the British Museum. I have a compared specimen.

E. integerrima Wlk.*

1857. Wlk., C. B. Mus., Het., XIII, 1057, *Homoptera*.
stylobata Harv.
1876. Harv., Can. Ent., VIII, 155, *Homoptera*.
1882. Grt., New List, 42, *Eubolina*.

HABITAT.—Texas in May and June; East Florida; Colorado.

Both types are in the British Museum, and refer without doubt to one species only.

E. mima Harv.*

1876. Harv., Can. Ent., VIII, 155, *Homoptera*.
1882. Grt., New List, 42, *Eubolina*.

HABITAT.—Texas; Colorado; Arizona.

The type is in the British Museum.

E. meskei Hy. Edw.*

1882. Hy. Edw., Papilio, II, 128, *Eubolina*.

HABITAT.—Texas.

The type, from the Meske collection, is in the U. S. National Museum.

Genus YPSIA Gn.

1852. Gn., Spec. Gen., Noct., III, 16.

Y. undularis Dru.*

1770. Drury, Illustr., I, pl. IX, f. 4, *Noctua*.
1816. Hbn., Verzeichniss, 275, *Anthracia*.
1852. Gn., Spec. Gen., Noct., III, 18, *Ypsia*.

1857. Wlk., C. B. Mus., Het., XIII, 1074, *Ypsia*.
var. **æruginosa** Gn.*
1852. Gn., Spec. Gen., Noct., III, 17, pl. XVIII, f. 7, *Ypsia*.
1857. Wlk., C. B. Mus., Het., XIII, 1074, *Ypsia*.
1865. Bethune, Canadian Journal, x, 259, *Ypsia*.
1878. Grt., Bull. Geol. Surv., IV, 185, *Ypsia*.
1883. Grt., Papilio, III, 73, pr. syn.
plenipennis Wlk.
1857. Wlk., C. B. Mus., Het., XIII, 1055, *Homoptera*.
var. **umbripennis** Grt.*
1877. Grt., Can. Ent., VIII, 109, *Homoptera*.

HABITAT.—Canada and Northern States, May, June, and August, to Florida; Colorado.

The Walker types are in the British Museum. A type of *æruginosa* is in the Jardin des Plantes, agreeing with the identification in American collections.

Genus PSEUDANTHRACIA Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 46.

P. coracias Gn.*

1852. Gn., Spec. Gen., Noct., III, 19, *Anthracia*.
1857. Wlk., C. B. Mus., Het., XIII, 1075,=*squammularis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 46, *Pseudanthracia*.
squammularis, Dru.
1770. Drury, Illustr., I, 18, pl, IX, f. 3, *Noctua*.
1857. Wlk., C. B. Mus., Het., XIII, 1075, *Anthracia*.
1865. Bethune, Canadian Journal, x, 248, *Anthracia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 46, ? pr. syn.

HABITAT.—Canada to Florida; Central States; New Mexico; Texas in March and December.

The above is the synonymy given by Mr. Grote, who seems to doubt the correctness of Walker's reference. I have made no attempt to get at the truth myself, and give the bibliography as I find it. I have not seen Guenée's type. The *squammularis* of the British Museum collection (Walker) is *Ypsia undularis*.

P. cornix Gn.

1852. Gn., Spec. Gen., Noct., III, 19, pl. XV, f. 8, *Anthracia*.
1857. Wlk., C. B. Mus., Het., XIII, 1075, *Anthracia*.
1865. Bethune, Canadian Journal x, 249, *Anthracia*.

HABITAT.—North America.

The species was described from the Boisduval collection, and the type is probably with M. Oberthür.

Genus SELENIS Gn.

1852. Gn., Spec. Gen., Noct., III, 361.

S. monotropa Grt.*

1876. Grt., Can. Ent., VIII, 207, *Selenis*.

HABITAT.—Texas.

The type is in the British Museum.

Genus YRIAS Gn.

1852. Gn., Spec. Gen., Noct., III, 21.

Y. clientis Grt.*

1882. Grt., Can. Ent., XIV, 236, *Yrias*.

Habitat.—Arizona.

Types are in the Neumœgen collection and in the National Museum.

Y. volucris Grt.

1883. Grt., Can. Ent., XV, 3, *Yrias*.

Habitat.—Arizona.

The type is with Mr. Neumœgen.

Y. repentis Grt.*

1881. Grt., Papilio, I, 165, *Homopyralis*.
1882. Grt., Can. Ent., XIV, 234, *Yrias*.

Habitat.—Arizona.

The type is with Mr. Neumœgen.

Y. crudelis Grt.*

1882. Grt., Can. Ent., XIV, 237, *Yrias*.

Habitat.—Arizona; Texas, in March; California.

A type is with Mr. Neumœgen; another in the National Museum.

Genus HOMOPYRALIS Grt.

1874. Grt., Proc. Ac. Nat. Sci. Phil., 213.

H. discalis Grt.*

1876. Grt., Can. Ent., VIII, 206, *Homopyralis*.

Habitat.—Canada; Northern, Middle and Central States; New Mexico; June to August in New York.

The type is in the British Museum.

H. contracta Wlk.*

1860. Wlk., Can. Nat. and Geol., V, 258, *Homoptera*.
1865. Bethune, Canadian Journal, X, 258, *Homoptera*.
1877. Grt., Can. Ent., IX, 28,= *Homopyralis tactus*.
zonata Wlk.
1865. Wlk., C. B. Mus., Het., XXXIII, 878, *Homoptera*.
tactus Grt.
1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 213, *Homopyralis*.
1877. Grt., Can. Ent., IX, 28, pr. syn.

Habitat.—Canada to Florida, to Texas; northern range in June and July; District of Columbia in August; Delaware in June.

The types of *zonata* and *tactus* are in the British Museum, and these are undoubtedly alike, specifically. Mr. Grote refers *contracta* positively to *tactus*, but continues to use his own specific name. The type of *contracta* is in the collection of the Entomological Society of Ontario.

H. tantillus Grt.*

1874. Grt., Proc. Ac. Nat. Sci. Phil., 1874, 214, *Homopyralis.*

HABITAT.—New York to Texas; Central States; Florida in March; Texas, March to July, and October.

The type is in the British Museum.

H. miserulata Grt.

1882. Grt., Can. Ent., XIV, 185, *Homopyralis.*
1883. Grt., Can. Ent., XV, 123, *Homopyralis.*

HABITAT.—New Mexico.

The type is in the Neumœgen collection.

Genus **MATIGRAMMA** Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 22.

M. pulverilinea Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 22, *Matigramma.*

HABITAT.—Southern States; Texas in March, April, June, and September.

A type is in the British Museum; another in the collection of the American Entomological Society.

M. pulverosa Wlk.

1865. Wlk., C. B. Mus., Het., XXXIII, 994, *Poaphila.*
læna Harv.

HABITAT.—Texas in March, May, and July.

Both the types are in the British Museum; but I have not succeeded in finding a description of *M. læna.* I presume such exists, for the species is correctly known in American collections; but I have not seen it.

M. rubrosuffusa Grt.

1882. Grt., Can. Ent., XIV, 172, *Matigramma.*
1883. Grt., Can. Ent., XV, 123, *Matigramma.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **ARGILLOPHORA** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 124.

A. furcilla Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 124, *Argillophora.*

HABITAT.—Alabama.

The type is in the British Museum. It is an odd species, which I had never before seen.

Genus **HYAMIA** Wlk.

1858. Wlk., C. B. Mus., Het., xvi, 72.

H. perditalis Wlk.*

1858. Wlk., C. B. Mus., Het., xvi, 234, *Hyamia*.
semilineata Wlk.
1865. Wlk., C. B. Mus., Het., xxxiii, 1102, *Legna*.
umbrifascia, Grt.
1873. Grt., Trans. Am. Ent. Soc., iv, 301, *Spargaloma*.

HABITAT.—Massachusetts in July; Middle States to Texas; New Mexico; District of Columbia in August; Texas in May and June.

The types are all in the British Museum. It is possible that *Hyamia* may have another type, not congeneric with *perditalis*. In that case *Legna* must be used, as the type and only species is *semilineata*. *Spargaloma* Grt., is antedated in any case. *H. perditalis* is from "locality unknown," but is evidently this species.

H. sexpunctata Grt.*

1873. Grt., Trans. Am. Ent. Soc., iv, 300, pl. i, f. 90, *Spargaloma*.

HABITAT.—Massachusetts in July; Middle States to Texas; New Mexico.

The type is in the British Museum.

H. punctipennis Grt.

1883. Grt., Can. Ent., xv, 122, *Spargaloma*.

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **HEXERIS** Grt.

1875. Grt., Can. Ent., vii, 176.

H. enhydris Grt.

1875. Grt., Can. Ent., vii, 176, *Hexeris*.

HABITAT.—Florida.

A very distinct form, the type of which is in the British Museum. I had not seen it previously.

Genus **SYLECTRA** Hbn.

1816. Hbn., Verzeichniss, 341.

S. erycata Cram.

1782. Cram., Pap. Exot., iii, 170, pl. 287, f. *D*, *E*, *Phalæna*.
1782. Cram., Pap. Exot., iv, 157, pl. 370, f. *E*., *Phalæna*.
1802. Latr., Gen. Crust. et Ins., iv, 228, *Herminia*.
1816. Hbn., Verzeichniss, 342, *Sylectra mirandalis*.
1852. Gn., Spec. Gen., Noct., iii, 340, *Teratocera*.
1858. Wlk., C. B. Mus., Het., xiv, 1542, *Teratocera*.
1864. Grt., Proc. Ent. Soc. Phil., ii, 441, *Sylectra*.
mirandalis Hbn.
1816. Hbn., Verzeichniss, 342, *Sylectra*.

HABITAT.—New York; Florida; Gulf States, southward.

A peculiar tropical form which has lost its way, apparently.

Hübner, in the Verzeichniss, cites *erycata* Cram., as a synonym to ***mirandalis***—*Salia egregia mirandalis*—without explanation or reference to any description of his species.

Genus **PANGRAPTA** Hbn.

1816. Hbn., Verzeichniss, 343.

P. decoralis Hbn.*

1818. Hbn., Zuträge, I, 18, ff. 93, 94, *Pangrapta*.
1816. Hbn., Verzeichniss, 343, *Pangrapta*.
1872. Grt., Trans. Am. Ent. Soc., IV, 91, *Pangrapta*.
geometroides Gn.
1852. Gn., Spec. Gen., Noct., III, 371, *Marmorinia*.
1858. Wlk., C. B. Mus., Het., XIV, 1598, *Marmorinia*.
epionoides Gn.
1852. Gn., Spec. Gen., Noct., III, 371, *Marmorinia*.
1858. Wlk., C. B. Mus., Het., XIV, 1597, *Mamorinia*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 47 pr. syn.
elegantalis Fitch.
1856. Fitch, 1st and 2nd Rept. Ins. N. Y., 327, pl. I, f. 2, *Hypena*.
1872. Grt., Trans. Am. Ent. Soc., IV, 92, pr. syn.
1880. Grt., Can. Ent., XII, 87, pr. syn.
recusans Wlk.
1866. Wlk., C. B. Mus., XXXV, 1970, *Thyridospila*.

HABITAT.—Nova Scotia to Florida; Texas; Central States; New York, June to August; District of Columbia, in August.

Guenée's type of *epionoides* is in the Jardin des Plantes, where I did not find it. The type of *geometroides* is in the Boisduval collection, now with M. Oberthür. Walker's type is in the British Museum, where I have examined it. Fitch's type I have seen, but do not know where it is at present. A careful comparison of Guenée's descriptions with a long series of specimens leaves no reasonable doubt that this species is intended.

Genus **PHALÆNOSTOLA** Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 302.

P. larentioides Grt. *

1873. Grt., Trans. Am. Ent., Soc., IV, 302, *Phalænostola*.
var. **citima** Grt.
1873. Grt., Trans. Am. Ent. Soc., IV, 303, *Phalænostola*.
1882. Grt., New List, 42, pr. var.

HABITAT.—Middle, Central, and Southern States; New York, in June and August; District of Columbia, in June; Missouri, in August.

The type is in the British Museum.

Genus **PSEUDAGLOSSA** Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 47.

P. lubricalis Geyer. *

1832. Geyer, Zuträge, IV, 19, ff. 665, 666, *Epizeuxis*.
1854. Gn., Spec. Gen., Delt., 77, *Helia*.
1859. Wlk., C. B. Mus., Het., XVI, 135, *Epizeuxis*.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 47. *Pseudaglossa.*
1881. Grt. Can. Ent., XIII, 91, *Epizeuxis.*
1880. Coquillett, Can. Ent., XII, 44, larva.
phæalis **Gn.**
1854. Gn., Spec. Gen., Delt., 76, *Helia.*
1859. Wlk., C. B. Mus., Het., XVI, 133. *Epizeuxis.*
1873. Grt., Trans. Am. Ent. Soc., IV, 308. *Helia.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 47, pr. syn.
1881. Grt., Can. Ent., XIII, 91, pr. syn.
surrectalis **Wlk.**
1859. Wlk., C. B. Mus., Het., XVI, 241. *Bleptina.*
1877. Grt., Can. Ent., IX, 29, pr. syn.
var. **occidentalis** Smith.
1884. Smith, Bull. Bkln. Ent. Soc., VII, 5, pr. var.

HABITAT.—United States, generally; Canada, in July; New York, June, July, August; Illinois, August, September; Texas, May to July. October; Colorado in October; Kansas in August; Nova Scotia.

Guenée himself suggested the identity of his *phæalis* with *lubricalis*; but, as Geyer recorded his species from Java, he kept his own specific term. Some other of Geyer's "Java" species are American, and I believe Mr. Grote was correct in making Guenée's suggestion a positive reference. The type of *surrectalis* is in the British Museum and is correctly referred by Mr. Grote. My types are in the National Museum and in the Edwards collection.

P. denticulalis Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 283. *Pseudaglossa.*

HABITAT.—Middle, Eastern, and Central States; District of Columbia, July and August.

The type is in the British Meuseum.

P. scobialis Grt.*

1880. Grt., No. Amer. Ent., I, 95, *Pseudaglossa.*

HABITAT.—Eastern, Middle, and Central States; New York, June and July.

The type is in the British Museum.

P. rotundalis Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIV, 1144, *Hormisa.*
borealis Smith.
1884. Smith, Bull. Bkln. Ent. Soc., VII, 5, *Helia.*

HABITAT.—Canada to Maryland to Illinois; Eastern, Middle, Central, and Southern States; District of Columbia in August.

The Walker type is in the British Museum and is the same as my *borealis*, the type of which is in the National Museum.

I have retained Mr. Grote's generic term for the preceding species, and use *Epizeuxis* instead of *Helia* for those following, pending the revisional study of this series, when the types can be fixed.

Genus **EPIZEUXIS** Hbn.

1816. Hbn., Verzeichniss, 346.

E. æmula Hbn.*

1815. Hbn., Ex. Schmett., III, 1, G. a., *Idiadolosa.*
1816. Hbn., Verzeichniss, 346, *Epizeuxis.*
1854. Gn., Spec. Gen., Delt., 78, *Helia æmulalis.*
1859. Wlk., C. B. Mus., Het., XVI, 134, *Epizeuxis.*
1873. Grt., Trans. Am. Ent. Soc., IV, 307, *Epizeuxis.*

mollifera Wlk.

1858. Wlk., C. B. Mus., Het., XV, 1765, *Microphysa.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, *Epizeuxis.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 47, pr. syn.

herminioides Wlk.

1860. Wlk., Can. Nat. and Geol., v, 259, *Homoptera.*
1865. Bethune, Canadian Journal, x, 258, *Homoptera.*
1877. Grt., Can. Ent., IX, 28, *Epizeuxis.*

effusalis Wlk.

1860. Wlk., Can. Nat. and Geol., v, 264, *Hormisa.*
1877. Grt., Can. Ent., IX, 29, pr. syn.

concisa Wlk.

1860. Wlk., Can. Nat. and Geol., v, 265, *Hormisa.*
1877. Grt., Can. Ent., IX, 29, pr. syn.

HABITAT.—Canada, New York, and Northern States, July to September; South and West to Texas in March, April, and July; New Mexico; Colorado in September.

The type of *mollifera* is in the British Museum and is correctly referred. Mr. Grote has placed *Hormisa absorptalis* to this same form; but this is an error: it is really *Litognatha nubilifascia.* The types of *effusalis* and *concisa* are in the collection of the Entomological Society of Ontario, and these have been positively referred to *æmula* by Mr. Grote. The type of *herminioides* , from the same collection, was referred to *Epizeuxis* by Mr. Grote. If this generic reference is correct, the description will apply to *æmula* rather than *americalis*, and I have so referred the species.

E. americalis, Gn.*

1854. Gn., Spec. Gen., Delt., 78, pl. 6, f. 5, *Helia.*
1859. Wlk., C. B. Mus., Het., XVI, 134, *Epizeuxis.*
1873. Gn., Trans. Am. Ent. Soc., IV, 307, *Epizeuxis.*
1883. Riley, Can. Ent., XV, 171, larva.

scriptipennis Wlk.

1858. Wlk., C. B. Mus., Het., XV, 1765, *Microphysa.*
1868. G. & R., Trans. Am. Ent. Soc., II, 79, pr. syn.
1873. Grt., Trans. Am. Ent. Soc., IV, 307, pr. syn.

HABITAT.—Canada and New York, July to September; to Texas, July and November; east of the Rocky Mountains; New Mexico.

Guenée's type is probably with M. Oberthür. The type of *scriptipennis* is in the British Museum, where there is also a specimen bearing the name *pulverosa* in Walker's handwriting.

Genus **MEGACHYTA** Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 306.

M. lituralis Hbn.*

1818. Hbn., Zutræge, I. 9, f. 19, 20, *Epizeuxis*.
1816. Hbn., Verzeichniss, 346, *Epizeuxis*.
1854. Gn., Spec. Gen., Delt., 79, *Helia*.
1859. Wlk., C. B. Mus., Het., XVI, 134, *Epizeuxis*.
1872. Zeller, Verh. k. k. zoöl. bot. Ges., XXII, 473, *Zanclognatha*.
1873. Grt., Trans. Am. Ent. Soc., IV, 306, *Megachyta*.

HABITAT.—Canada to Florida and Texas; Central States; New York and Delaware in June; District Columbia in August.

M. theralis Wlk.*

1859. Wlk., C. B. Mus., Het., XIX, 855, *Herminia*.
deceptricalis Zell.
1872. Zeller, Verh. k. k. zoöl. bot. Ges., XXII, 473, *Zanclognatha*.
var. **gypsalis** Grt.
1880. Grt., Bull. Bkln. Ent. Soc., III, 65, *Megachyta*.

HABITAT.—Nova Scotia to North Carolina, to Ohio.

Walker's type is in the British Museum, and is the *deceptricalis* of the Grote collection and of Zeller. The type of *gypsalis*, also in the Museum, is a partly suffused form, scarcely worthy of a varietal name.

M. inconspicualis Grt.

1883. Grt., Can. Ent., XV, 30, *Megachyta*.

HABITAT.—New York.

The type is in the Hill collection.

Genus **HORMISA** Wlk.

1859. Wlk., C. B. Mus., Het., XVI, 74.

H. absorptalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 74, *Hormisa*.
nubilifascia Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 85, pl. 2, f. 2, 3, *Litognatha*.

HABITAT.—Canada to Virginia; Central States; New York, in July.

Both types are in the British Museum. Mr. Grote refers *absorptalis* to *Epizeuxis æmula*, and at first sight this appears correct, from the rubbed condition of the specimen; but more careful comparisons show that the species named by Mr. Grote *nubilifascia* is represented. The present species is fairly to be considered the type of *Hormisa*, and must replace *Litognatha*, which has the same type. A type of *nubilifascia* is also in Dr. Lintner's collection.

H. litophora Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 86, *Litognatha*.

HABITAT.—Middle and Central States.

The types are in the British Museum and in Dr. Lintner's collection.

H. linearis Grt.

1883. Grt., Can. Ent., xv, 121, *Litognatha.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **HERMINIA** Latr.
1802. Latr., Gen. Crust. et Ins., III, 413, et IV, 2281

I use the term *Herminia* in preference to *Chytolita* Grt., because I can not find any sufficient differences between them. The genera need revision.

H. morbidalis Gn.*

1854. Gn., Spec. Gen., Delt., 56, pl. 6, f. 3, *Herminia.*
1859. Wlk., C. B. Mus., Het., XVI, 103, *Herminia.*
1872. Grt., Trans. Am. Ent. Soc., IV, 96, *Herminia.*
1873. Grt., Trans. Am. Ent. Soc., IV, 309, *Chytolita.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Chytolita.*
1880. Coquillett, Can. Ent., XII, 44, larva.

HABITAT.—Nova Scotia; southward to Virginia; Central States; Canada and New York in June and July.

The types are probably with M. Oberthür.

H. petrealis Grt.*

1880. Grt., Can. Ent., XII, 219, *Chytolita.*

HABITAT.—Middle and Central States; Canada.

The type is in the British Museum.

Genus **PITYOLITA** Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39.

P. pedipilalis Gn.*

1854. Gn., Spec. Gen., Delt., 57, *Herminia.*
1859. Wlk., C. B. Mus., Het., XVI, 57, *Herminia.*
1872. Grt., Trans. Am. Ent. Soc., IV, 96, *Herminia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Pityolita.*

HABITAT.—Middle and Central States; Virginia; New York in June; Missouri in June; District of Columbia in August; Delaware in May.

The type is probably with M. Oberthür. In the British Museum are specimens of this species and of *morbidalis*, apparently named by Guenée.

Genus **ZANCLOGNATHA** Led.
1857. Lederer, Noct. Europ., 211.

Z. lævigata Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 95, *Herminia.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Zanclognatha.*
1878. Grt., Bull. Geol. Surv., IV, 186, *Zanclognatha.*

HABITAT.—Canada to Southern States; Central States; Canada and New York in July.

Types are in the collection of the American Entomological Society and in the British Museum. This species is the *cruralis* of the British collection; but not of Guenée's description, which I believe has been correctly interpreted by Mr. Grote.

Z. obsoleta Smith. *

1884. Smith, Bull. Bkln. Ent. Soc., VII, 5, *Zanclognatha*.

HABITAT.—Vermont in August.

The type is in the National Museum.

Z. ochreipennis Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 98, *Herminia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Zanclognatha*.

HABITAT.—Canada to Virginia; Central States; Canada and New York in July; Delaware and District of Columbia in August.

The type is in the collection of the American Entomological Society.

Z. cruralis Gn.*

1854. Gn., Spec. Gen., Delt., 58, *Herminia*.
1859. Wlk., C. B. Mus., Het., XVI, 103, *Hermixia*.
1872. Grt., Trans. Am. Ent. Soc., IV, 97, *Herminia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I. 39. *Zanclognatha*.
jacchusalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 104, *Herminia*.

HABITAT.—Nova Scotia to Virginia; Central States; New Mexico; New York and Illinois in July and August; District of Columbia in August.

The type of *cruralis* is probably with Mr. Oberthür. The Walker type is in the British Museum and is the *cruralis* of Guenée, but not of Walker. The latter is *lævigata* Grt.

Z. marcidilinea Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 93 et 309, *Herminia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Zanclognatha*.

HABITAT.—New York to Alabama; Central States; Adirondack Mountains, July and September; Delaware in July.

The type is in the collection of the American Entomological Society. The *Z. ochreipennis* and *marcidilinea* of the British Museum are the same species. There is more difference between the types.

Z. obscuripennis Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 98 and 309, *Herminia*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 39, *Zanclognatha*.

HABITAT.—New York to Alabama.

The types are in the collection of the American Entomological Society and the British Museum. It is more than likely that this will prove a dark form of *ochreipennis*. The species need revision, and as the types are mostly in Philadelphia the work will not be difficult.

Z. protumnusalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 104, *Herminia*.
minimalis Grt.
1878. Grt., Bull. Geol. Surv., IV, 186, *Zanclognatha*.
1891. Smith, List Lepid., 63, pr. syn.

HABITAT.—Canada; Middle and Central States; District of Columbia in August.

The types are both in the British Museum and are alike. I have a carefully compared specimen.

Genus CLEPTOMITA Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 301.

C. atrilineella Grt.

1873. Grt., Trans. Am. Ent. Soc., IV, 301, *Cleptomita*.

HABITAT.—Texas.

I have somewhere seen a specimen of this species marked type; but I have no memorandum concerning it and can not now recollect the circumstances. A specimen is in the collection of the American Entomological Society, and this may be the type of my recollection, though not now so marked.

Genus PALLACHIRA Grt.

1877. Grt., Can. Ent., IX, 197.

P. bivittata Grt.*

1877. Grt., Can. Ent., IX, 198, *Pallachira*.

HABITAT.—Canada; Northern, Middle, and Central States; occasional.

The type is with Dr. Thaxter.

Genus PHILOMETRA Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 99.

P. goasalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 134, *Epizeuxis*.
1859. Wlk., C. B. Mus., Het., XIX, 876, *Epizeuxis*.
metonalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 236, *Herminia*.
longilabris Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 99, 309, *Philometra*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 40, *Philometra*.

HABITAT.—Nova Scotia; Hudson's Bay Territory to Virginia; Central States; June, July, and August.

Walker's types are in the British Museum and agree with each other and with the Grote type in the collection of the American Entomological Society. The latter type has just body enough remaining to hold the wings together. Head, feet, and everything else are gone. Under *goasalis* Walker has also a specimen of *Herminia petrealis* Grt., which he did not recognize as distinct.

P. eumelusalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 105, *Herminia.*
serraticornis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 98, 309, *Philomctra.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 40, *Philometra.*
1891. Smith, List Lepid., 63, pr. syn.

HABITAT.—Canada and New York, in July, to Virginia; Central States.

The type of *eumelusalis* is in the British Museum, that of *serraticornis* is in the collection of the American Entomological Society. The latter consists of wings only, with a piece of thorax to hold them together.

Genus **SALIA** Hbn.

1816. Hbn., Verzeichniss, 339.

S. interpuncta Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 93, *Madopa.*
1873. Grt., Trans. Am. Ent. Soc., IV, 309, *Calobochila.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, *Calobochila.*
1875. Grt., Bull. Buff. Soc. Nat. Sci., II, 223, *Salia.*
1880. Grt., Can. Ent., XII, 220, *Salia.*
saligna Zell.
1872. Zell., Verh. k. k. zoöl. bot. Ges., XXII, 462, *Calobochila.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 170, pr. syn.

HABITAT.—Massachusetts to Florida and Texas.

I have not seen the type.

S. rufa Grt.*

1883. Grt., Can. Ent., XV, 31, *Salia.*

HABITAT.—Arizona.

The types are in the National Museum and in the Neumœgen collection.

Genus **RIVULA** Gn.

1854. Gn., Spec. Gen., Delt., 47.

R. propinqualis Gn.*

1854. Gn., Spec. Gen., Delt., 49, *Rivula.*
1859. Wlk., C. B. Mus., Het., XV, 93, *Rivula.*
1875. Speyer, Stett. Ent. Zeit., XXXVI, 169, *Rivula.*

HABITAT.—Nova Scotia to Texas; Central States. Canada in June; New York, June and July; District of Columbia in August.

The type is in the British Museum.

R. tripla Grt.

HABITAT.—Arizona; New Mexico.

The type is in the Neumœgen collection and is not a *Rivula*, probably not even a Deltoid. The neuration is normally noctuidous, not aberrant as in *Rivula*, but otherwise I have had no opportunity of trying to ascertain its true position. I have found no description of the species and perhaps this is a mere collection name which should not be criticised.

Genus **PALTHIS** Hbn.

1816. Hbn., Verzeichniss, 342.

P. angulalis Hbn.*

1796. Hbn., Schmett. Eur., Pyr., f. 107, *Pyralis*.
1816. Hbn., Verzeichniss, 342, *Palthis*.
1825. Tr., Schmett. Eur., v, 36, Hypena.
1852. H. Sch., Eur. Schmett., vi, 382, *Herminia*.
1854. Gn., Spec. Gen., Delt., 95, *Clanyma*.
1859. Wlk., C. B. Mus., Het., xvi, 152, *Palthis*.
1872. Grt., Trans. Am. Ent. Soc., iv, 107, *Clanyma*.
1873. Grt., Trans. Am. Ent. Soc., iv, 309, *Palthis*.
aracinthusalis Wlk.
1859. Wlk., C. B. Mus., Het., xvi, 157, *Mardara*.

HABITAT.—Canada, in June, to Texas; Central States; New York, June to August; Missouri, May and June; District of Columbia, in May.

Walker's type is in the British Museum and is this common species. No locality was given and both generic and specific descriptions are such that recognition was out of question.

P. asopialis Gn.*

1854. Gn., Spec. Gen., Delt., 96, *Clanyma*.
1859. Wlk., C. B. Mus., Het., xvi, 152, *Palthis*.
1872. Grt., Trans. Am. Ent. Soc., iv, 108, *Clanyma*.
1873. Grt., Trans. Am. Ent. Soc., iv, 309, *Palthis*.

HABITAT.—With the preceding.

The type is probably with M. Oberthür.

Genus **HETEROGRAMMA** Gn.

1854. Gn., Spec. Gen., Delt., 91.

H. pyramusalis Wlk.*

1859. Wlk., C. B. Mus., Het., xvi, 106, *Herminia*.
gyasalis Wlk.
1859. Wlk., C. B. Mus., Het., xix, 856, *Herminia*.
rurigena Grt.
1873. Grt., Trans. Am. Ent. Soc., iv, 305, *Phalænophana*.
1884. Smith, Bull. Bkln. Ent. Soc., vii, 6, *Heterogramma*.

HABITAT.—Canada, in June; New York, in May; Middle, Central and Southern States; Missouri and District of Columbia, in August.

All the types are in the British Museum and were directly compared.

H. palligera Smith.*

1884. Smith, Bull. Bkln. Ent. Soc., vii, 6, *Heterogramma*.

HABITAT.—California; Florida.

The types are in the National Museum and Edwards collection. It is perhaps possible that the Floridian form is not the same as that from California; but the differences have seemed unimportant from the material at command.

Genus **PSEUDORGYIA** Harv.

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 283.

P. versuta Harv.*

1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 284, *Pseudorgyia.*

HABITAT.—Texas, in May.

The type is in the British Museum. A series of specimens in the National Museum from the Belfrage collection, evidently form part of the lot from which Dr. Harvey's type was received.

P. russula Grt.

1883. Grt., Papilio, III, 75, *Pseudorgyia.*

HABITAT.—Arizona.

The type is in the Neumœgen collection.

Genus **SISYRHYPENA** Grt.

1873. Grt., Can. Ent., v, 227.

S. orciferalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 235, ? *Hormisa.*
1859. Wlk., C. B. Mus., Het., XIX, 876, ? *Epizeuxis.*
pupillaris Grt.
1873. Grt., Can. Ent., v, 227, *Sisyrhypena.*

HABITAT.—Texas; Southern States.

Both the types are in the British Museum and have been directly compared.

Genus **CAPIS** Grt.

1882. Grt., Can. Ent., XIV, 20, 119.

C. curvata Grt.*

1882. Grt., Can. Ent., XIV, 20 et 119, *Capis.*
1882. Smith, Can. Ent., XIV, 100, *Capis.*
1882. Grt., Papilio, II, 185, *Capis.*
1883. Grt., Can. Ent., XV, 6, *Capis.*

HABITAT.—Canada, in July; Maine to New York; Northern and Middle States.

Types are in the British Museum and in the U. S. National Museum.

Genus **RENIA** Gn.

1854. Gn., Spec. Gen., Delt., 91.

R. discoloralis Gn.*

1854. Gn., Spec. Gen., Delt., 82, *Renia.*
fallacialis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 38, *Hypena.*
1872. Grt., Trans. Am. Ent. Soc., IV, 25, 100, pr. syn
generalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 29, *Hypena.*
thraxalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 109, *Herminia.*
1891. Smith, List Lepidopt., 63, pr. syn.

HABITAT.—Canada to Virginia; Central States; New York and Delaware, in July; District of Columbia, in August.

Guenée's types are probably with M. Oberthür. The Walker types are in the British Museum. They agree with each other and with the specimens identified by Mr. Grote as *discoloralis*. Walker did not really recognize Guenée's genus and described a number of species belonging to it under *Herminia* and *Hypena*. Curiously enough, nearly all of Walker's Deltoids can be recognized from the description. I tried to recognize the species before I expected to have the chance to study them autoptically, and in every case my identification proved correct. Under *fallacialis*, Walker's first specimen from which the description was drawn is *discoloralis*, while the others are *brevirostralis*.

R. salusalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 107, *Herminia*.
brevirostralis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 25, *Renia*.
1873. Grt., Trans. Am. Ent. Soc., IV, 309, pl. I, ff.; 91, 92, *Renia*.

HABITAT.—Eastern, Middle, and Central States; Alabama; Colorado.

Walker's type is in the British Museum.

Types of the Grote species are in the collection of the American Entomological Society and also in the British Museum. I could thus compare the types of both species.

R. alutalis Grt.

1872. Grt., Trans. Am. Ent. Soc., IV, 99, *Renia*.
1873. Grt., Trans. Am. Ent. Soc., IV, 309, *Renia*.

HABITAT.—Middle States.

I have not seen the type. It was probably in the collection at Philadelphia, and has been destroyed. The specimens in the British Museum from the Grote collection agree with my identification of the species.

R. sobrialis Wlk.

1859. Wlk., C. B. Mus., Het., XVI, 228, *Hypena*.
restrictalis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 26, pl. I, f. 94, *Renia*.

HABITAT.—Nova Scotia to Virginia; Central States.

Walker's type is in the British Museum. Types of Grote's species are in the collection of the American Entomological Society and in the British Museum.

R. larvalis Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 20, *Renia*.
1873. Grt., Trans. Am. Ent. Soc., IV, 303, *Renia*.

HABITAT.—New York in August, to Texas; Delaware in May; Central States; Florida in March.

Types are in the collection American Entomological Society and in the British Museum. This seems to me only a larger and paler form of *restrictalis*. The palpal characters pointed out by Mr. Grote are evanescent, I believe; but it will require further study to state this positively.

R. clitosalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 108, *Herminia*.
centralis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 27, *Renia*.

HABITAT.—Nova Scotia to West Virginia; Central States; New York in August; District of Columbia in August.

Walker's type is in the British Museum. Types of the Grote species are in the collection of the American Entomological Society and in the British Museum. From a specimen named by Walker in the D'Urban collection, Mr. Grote referred this name to *Bleptina caradrinalis* (Can. Ent., IX, 29). It is probable that this is only a small, dark form of *sobrialis* (*restrictalis*).

R. flavipunctalis Geyer.*

1832. Geyer, Zutræge, IV, 25, f. 701, 702, *Antiblemma*.
1859. Wlk., C. B. Mus., Het., XIX, 859, ? *Herminia*.
1881. Grt., Can. Ent., XIII, 91, *Renia*.
phalerosalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 107, *Herminia*.
heliusalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 108, *Herminia*.
pastoralis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 27, *Renia*.
1873. Grt., Trans. Am. Ent. Soc., IV, 304, = *belfragei*.
belfragei Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 27, *Renia*.
1873. Grt., Trans. Am. Ent. Soc., IV, 304, pl. I, f. 95, *Renia*.
1883. Grt., Can. Ent., XIII, 91, pr. syn.

HABITAT.—Canada to Texas; Alabama; New Mexico; New York in July and August; Texas, May and June; Colorado in August and September.

Geyer's species was described from Java; but represents our common form. Types of the Grote and Walker species are in the British Museum, and a type of *belfragei* is also in the collection of the American Entomological Society.

R. factiosalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 37, *Hypena*.
plenilinealis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 99, *Renia*.

HABITAT.—Canada in August; Middle States; Colorado in August and September.

Walker's type is in the British Museum, while Mr. Grote's is in the collection of the American Entomological Society. It is likely that *alutalis* will come to this species as a variety.

Genus **TETANOLITA** Grt.
1873. Grt., Trans. Am. Ent. Soc., IV, 305.

T. mynesalis Wlk.*

1859. Wlk., C. B. Mus., Het., XIX, 860, *Bleptina.*
lixalis Grt.
1873. Grt., Trans. Am. Ent. Soc., IV, 306, *Tetanolita.*

HABITAT.—Middle, Central and Southern States; Illinois in July; Texas in March, May, and October.

Walker's type is in the British Museum and is like the *lixalis* of the Grote collection. The type of the latter I have not seen. It was probably at Philadelphia, as were most of the species described by Mr. Grote in the two papers in the fourth volumne of the "Transactions."

Genus **BLEPTINA** Gn.
1854. Gn., Spec. Gen., Delt., 66.

B. caradrinalis Gn.*

1854. Gn., Spec. Gen., Delt., 67, *Bleptina.*
1859. Wlk., C. B. Mus., Het., XVI, 120, *Bleptina.*
1872. Grt., Trans. Am. Ent. Soc., IV, 93, *Bleptina.*
1878. Grt., Bull. Geol. Surv., III, 799, *Bleptina.*
cloniasalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 105, *Herminia,*
1877. Grt., Can. Ent., IX, 29, pr. syn.

HABITAT.—Canada to Texas to Colorado; New Mexico; northern range in July; Texas in April, May, and June; Kansas in June; Delaware in June; Colorado in June.

Guenée's type is probably with M. Oberthür. Walker's type is in the British Museum.

B. inferior Grt.*

1872. Grt., Trans. Am. Ent. Soc., IV, 94, *Bleptina.*

HABITAT.—New York to Alabama; Central States; Texas in May, August, and October.

The type is in the collection of the American Entomological Society.

Genus **HYPENULA** Grt.
1876. Grt., Can. Ent., VIII, 27.

H. cacuminalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 37, *Hypena.*
1891. Smith, List Lepid., 63, *Hypenula.*
biferalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 237, *Herminia.*
opacalis Grt.
1876. Grt., Can. Ent., VIII, 27, *Hypenula.*

HABITAT.—Southern States; Texas, May and August.

All the types are in the British Museum, and refer to one species only.

Genus **LOMANALTES** Grt.

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 13.

L. eductalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 36, *Hypena*.
lætulus Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 14, pl. 1, ff. 12, 13, *Lomanaltes*.

HABITAT.—Nova Scotia to Pennsylvania; Minnesota; New York in May.

Both the types are in the British Museum, and refer to one species only.

Genus **BOMOLOCHA** Hbn.

1816. Hbn., Verzeichniss, 343.

B. baltimoralis Gn.*

1854. Gn., Spec. Gen., Delt., 34, *Hypena*.
1859. Wlk., C. B. Mus., Het., XVI, 31, *Hypena*.
1870. Rob., Ann. Lyc. Nat. Hist., N. Y., IX, 310, *Hypena*.
1872. Grt., Trans. Am. Ent. Soc., IV, 102, *Hypena*.
1873. Grt., Trans. Am. Ent. Soc., IV, 309, *Bomolocha*.
1873. Grt., Can. Ent., V, 226, *Bomolocha*.
1882. Pack., Papilio, II, 181, larva.
benignalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 32, *Hypena*.
1870. Rob., Ann. Lyc. Nat. Hist., N. Y., IX, 310, pr. syn.
1873. Grt., Can. Ent., V, 220, pr. syn.
laciniosa Zell.
1872. Zell., Verh. k. k. zoöl.-bot. Ges., XXII, 464, pl. II, f. 8, *Hypena*.
1873. Grt., Can. Ent., V, 226, pr. syn.

HABITAT.—Nova Scotia to Middle and Central States; Canada and New York in June; District of Columbia in August.

Guenée's type is probably with M. Oberthür. The Walker and Zeller types are in the British Museum. *Benignalis* is the paler form of the species; *laciniosa* is the darker, more typical form.

B. scutellaris Grt.*

1873. Grt., Can. Ent., V, 225, *Bomolocha*.

HABITAT.—British Columbia; Middle and Northern States; New York in August.

The type is in the British Museum. I have a carefully compared figure of the specimen.

H. manalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 33, *Hypena*.
1870. Rob., Ann. Lyc. Nat. Hist., N. Y., IX, 311, *Hypena*.
1872. Grt., Trans. Am. Ent. Soc., IV, 103, *Hypena*.
1873. Grt., Trans. Am. Ent. Soc., IV, 309, *Bomolocha*.

HABITAT.—Canada; Northern and Middle States; Minnesota; District of Columbia in June.

The type is in the British Museum.

B. bijugalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 32, *Hypena.*
1870. Rob., Ann. Lyc. Nat. Hist., N. Y., IX, 311, *Hypena.*
1872. Grt., Trans. Am. Ent. Soc., IV, 103, *Hypena.*
1873. Grt., Trans. Am. Ent. Soc., IV, 309, pl. I, f, 93, *Bomolocha.*
1873. Grt., Can. Ent., V, 226, *Bomolocha.*
pallialis Zell.
1872. Zell., Verh. k. k. zoöl. bot. Ges., XXII, 466, pl. II, f. 9, *Hypena.*
1873. Grt., Can. Ent., V, 226, pr. syn.
fecialis Grt.
1881. Grt., Can. Ent., XIII, 133, *Bomolocha.*

HABITAT.—Canada to Florida, west to the Rocky Mountains; Canada and New York in June; Texas in July.

The Walker and Grote types are in the British Museum. *Fecialis* is based on a washed out, faded specimen, which thus looks different.

B. abalinealis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 31, *Hypena.*
1872. Grt., Trans. Am. Ent. Soc., IV, 102, *Hypena.*
1873. Grt., Can. Ent., V, 226, *Bomolocha.*
1891. Dyar, Can. Ent., XXIII, 157, larva.

HABITAT.—Canada; Eastern, Middle, and Central States; June, July, and August.

The type is in the British Museum.

B. annulalis Grt.

1876. Grt., Check List Noct., 45, *Bomolocha.*

HABITAT.—Texas.

The type in the British Museum represents a species I had not before seen.

B. achatinalis Zell.*

1872. Zell., Verh. k. k. zoöl. bot. Ges., XXII, 468, pl. II, f. 7, *Hypena.*
1873. Grt., Can. Ent., V, 226,=*madefactalis.*

HABITAT.—Middle States to Texas; Delaware in June.

The type is in the Museum of Comparative Zoölogy at Cambridge. Zeller suspected that he might be redescribing Guenée's species, and Mr. Grote at once discovered that it was what he had identified as such, and referred Zeller's name to the synonymy. Later he restored the name, and has continued to use it as well as *madefactalis* without further explanation. There seems to be some confusion of labels in the Grote collection, for the same species is named both *toreuta* and *achatinalis.*

B. madefactalis Gn.

1854. Gn., Spec. Gen., Delt., 35, *Hypena.*
1859. Wlk., C. B. Mus., Het., XV, 33, *Hypena.*
1872. Grt., Trans Am. Ent. Soc., IV, 103, *Hypena.*
1873. Grt., Can. Ent., V, 226, *Bomolocha.*

HABITAT.—Middle and Southern States.

Described from a figure by Abbot. I am not certain that this species, as distinct from the forms of *achatinalis*, has been identified in our collections.

B. idæusalis Wlk.*

1859. Wlk., C. B. Mus., Het., xix, 839, ? *Hypena.*
citata Grt.
1872. Grt., Trans Am. Ent. Soc., iv, 101, *Hypena.*
1876. Grt., Check List Noct., 45, *Bomolocha.*
trituberalis Zell.
1872. Zell., Verh. k. k. zoöl. bot. Ges., xxii, 469, pl. ii, f. 6, *Hypena.*
1882. Grt., New List, 44, pr. syn.

Habitat.—Southern States; Texas; Illinois in August.

The Grote and Walker types are in the British Museum. The Zeller type is at Cambridge, and all refer to one species.

B. mitographa Grt.

1873. Grt., Trans. Am. Ent. Soc., iv, 296, *Erastria.*
1881. Grt., Papilio, i, 11, *Eustrotia.*

Habitat.—Alabama.

The type is in the British Museum. It is only half a specimen, both wings of one side missing; but it shows plainly a *Hypena* near *citata*, unlike anything I had before seen.

B. toreuta Grt.*

1872. Grt., Trans. Am. Ent. Soc., iv, 24, *Hypena.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., i, 38, *Euhypena.*
internalis || Rob.
1870. Rob., Ann. Lyc. Nat. Hist. N. Y., ix, 311, *Hypena.*
1892. Grt., Trans. Am. Ent. Soc., iv, 24, pr. syn.
albisignalis Zell.
1872. Zell., Verh. k. k. zoöl. bot. Ges., xxii, 463, *Hypena.*
1876. Grt., Check List Noct., 45, pr. syn.

Habitat.—Middle States to Texas, July.

Mr. Grote's type is in the collection of the American Entomological Society. The Zeller type is at Cambridge.

B. sordidula Grt.*

1872. Grt., Trans. Am. Ent. Soc., iv, 103, *Hypena.*

Habitat.—Pennsylvania; Texas.

I have not seen the type. The specimens in the Grote collection in the British Museum are from Belfrage, Texas. It is likely that the typical example was in the collection of the American Entomological Society.

B. umbralis Smith.*

1884. Smith, Bull. Bkln. Ent. Soc., vii, 4, *Bomolocha.*

Habitat.—Florida.

The type is in the National Museum.

B. caducalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 35, *Hypena.*
profecta Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 104, *Hypena.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 30, *Macrhypena.*

HABITAT.—Canada, Northern, Eastern, and Middle States.

Mr. Walker's type is in the British Museum. Where the Grote type is at present, I do not know. The specimens of *profecta* from the Grote collection are like the Walker species.

B. deceptalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 30, *Hypena.*
1872. Grt., Trans. Am. Ent. Soc., IV, 104, *Hypena.*
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 51, *Macrhypena.*

HABITAT.—Canada to Virginia; Central States; New York in July.

The type is in the British Museum. The specimens so named in the Grote collection are like the type.

B. damnosalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 28, *Hypena.*
perangulalis Harv.
1875. Harv., Bull. Buff. Soc. Nat. Sci., II, 283, *Bomolocha.*

HABITAT.—Canada to Middle and Central States; New York in July.

Walker's type is in the British Museum and is like the *perangulalis* of the Grote collection and of American collections generally. Other specimens associated with the type by Walker are *deceptalis.* As a matter of fact, I believe that the two names refer to forms of one species only.

B. edictalis Wlk.*

1859. Wlk., C. B. Mus., Het., XVI, 28, *Hypena.*
vellifera Grt.
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 87, pl. II, f. 7, *Meghypena.*

HABITAT.—Canada; New York in July; Northern and Eastern States.

Walker's type is in the British Museum; the Grote type is in the National Museum from the Meske collection. Specimens of *vellifera* from the Grote collection made actual comparison possible.

B. lentiginosa Grt.*

1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 87, *Meghypena.*

HABITAT.—New York; Northern States.

The type is with Dr. Lintner. I believe that this is merely a form of the preceding.

Genus **HYPENA** Schrank.

1802. Schrank. Fauna Boica. II. 2, 163.

H. humuli Harr.*

1835. Harris, Cat. Ins. Mass., 74, *Crambus*.
1841. Harris, Rept. Ins. Mass.. 345, *Hypena*.
1855. Fitch, Trans. N. Y. State Agl. Soç., XV. 555, pl. I, f. 1. *Hypena*.
1856. Fitch, 1st and 2d Rept. Ins. N. Y.. 323, pl. I. f. 1. *Hypena*.
1862. Harris, Injurious Insects, Flint ed,, 477. f. 237, *Hypena*.
1872. Grt., Trans. Am. Ent. Soc., IV. 101. *Hypena*.
1878. Lint., Ent. Cont., IV, 128, *Hypena*.
eranidalis Rob.
1870. Rob., Ann. Lyc. Nat. Hist., N. Y., IX, 311, *Hypena*.
1872. Grt., Trans. Am. Ent. Soc., IV, 101, *Hypena*.
1872. Grt., Can. Ent., IV, 111, *Hypena*.
1873. Grt., Trans. Am. Ent. Soc., IV, 309, pl. I, f. 87, *Hypena*.
1878. Lint., Ent. Cont., IV, 128, pr. syn.
germanalis Wlk.
1859. Wlk., C. B. Mus., Het., XVI, 35, *Hypena*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 52, pr. syn.
var. **olivacea** Grt. *
1873. Grt., Can. Ent., V, 226, *Hypena*.
1882. Grt., New List, 44, pr. var.
var. **albopunctata** Tepper.
1881. Tepper, Bull. Bkln. Ent. Soc., IV, 2, pl. I, f. 5, *Hypena*.
1891. Smith, List Lepid., 64, pr. var.

HABITAT.—Canada; Northern and central United States, south to Alabama, west to Washington; Colorado in September, October; British Columbia, May to July, September, October; Delaware in August; Kansas in April.

A specimen labeled *humuli* is in the Harris collection at the Boston Society of Natural History, and is presumably a type. The type of *eranidalis* I have not seen. That of *germanalis* is in the British Museum and is normal *humuli*. In the same collection is the type of *olivacea*, which scarcely deserves a varietal name. The type of *albopunctata* is in the Tepper collection, and is a very dark, almost black, form from Washington. But for a very large series from widely divergent localities I would have considered this Pacific coast form specifically distinct. A series from British Columbia recently received places the relationship beyond reasonable doubt.

H. californica Behr.*

1870. Behr, Trans. Am. Ent. Soc., III, 23, *Hypena*.

HABITAT.—California; British Columbia.

Typical specimens are in the Edwards collection.

H. decorata Smith.*

1884. Smith, Bull. Bkln. Ent. Soc., VII, 4, *Hypena*.

HABITAT.—California; Vancouver.

Types are in the National Museum and in the Edwards collection.

H. scabra Fabr.*

1794. Fabr., Ent. Syst., Suppl., IV, 448, *Hyblæa.*
1854. Gn., Spec. Gen., Delt., 40, *Hypena.*
1859. Wlk., C. B. Mus., Het., XVI, 34, *Hypena.*
1872. Grt., Trans. Am. Ent. Soc., IV, 102, *Hypena.*
1873. Lint., Can. Ent., V, 81, *Hypena.*
1873. Grt., Bull. Buff. Soc. Nat. Sci., I, 38, *Plathypena.*
1880. Riley, Amer. Ent., III, 8, *Hypena.*
1880. Coquillett, Can. Ent., XII, 43, larva.
1881. Coquillett, Can. Ent., XIII, 137, larva.
erectalis Gn.
1854. Gn., Spec. Gen., Delt., 40, *Hypena.*
1859. Wlk., C. B. Mus., Het., 35, ? an var. pr.
1872. Grt., Trans. Am. Ent. Soc., IV, 102, *Hypena.*
1873. Lint., Can. Ent., V, 81,= ♀ prec.
palpalis Haw.
1812. Haw., Lep. Britt., 361, *Crambus.*
1829. Steph., Ill. Brit. Ent., Haust., IV, 12, *Hypena.*
1854. Gn., Spec. Gen., Delt., 40, pr. syn.
1859. Wlk., C. B. Mus., Het., XVI, 34, pr. syn.
crassatus Haw.
1812. Haw., Lep. Britt., 336, *Crambus.*
1854. Gn., Spec. Gen., Delt., 40, ? = *erectalis.*
1859. Wlk., C. B. Mus., Het., XVI, 35, = *erectalis.*
obesalis Steph.
1829. Steph., Ill. Brit. Ent., Haust., IV, 11, *Hypena.*
1859. Wlk., C. B. Mus., Het., XVI, 35, = *erectalis.*
subrufalis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 102, var. *erectalis.*

HABITAT.—Nova Scotia to Texas; east of the Rocky Mountains, June to October.

I have seen none of the types. The references to Haworth and Stephens are from Walker and have not been verified by me.

Of the other American species referred to *Hypena* by Walker, *H. rufinalis* is *Crambus abtrusellus* Wlk., and *H. cæcalis* is *Scoparia centuriella.* The comparisons for the specific determination of these insects were kindly made for me by Mr. Warren, after I had pointed out the specimens to him.

Genus GABERASA Wlk.

1865. Wlk., C. B. Mus., Het., XXXIV, 1197.

G. ambigualis Wlk.*

1865. Wlk., C. B. Mus., Het., XXXIV, 1198,, *Gaberasa.*
bifidalis Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 105, *Tortricodes.*
1878. Grt., Bull. Geol. Surv., VI, 564, *Eulintneria.*
♀ *indivisalis* Grt.
1872. Grt., Trans. Am. Ent. Soc., IV, 106, *Tortricodes.*
1873. Grt., Trans. Am. Ent. Soc., IV, 308, *Heterogramma.*
1878. Lintner, Ent. Contrib., IV, 110, pr. syn.

HABITAT.—Canada to Texas; New York May to August.

The type of the Walker species is in the British Museum. Both the Grote types are in the collection of the American Entomological Society. I use Walker's generic term in preference to *Tortricodes*, used in my list of Lepidoptera, because the South American species seen by me resemble our species less than the generic description would indicate.

Genus **DERCETIS** Grt.

1878. Grt., Bull. Geol. Surv., IV, 186.

D. **vitrea** Grt. *

1878. Grt., Bull. Geol. Surv., IV, 187, *Dercetis*.

HABITAT.—New York in July; Middle States.

D. **pygmæa** Grt. *

1878. Grt., Bull. Geol. Surv., IV, 187, *Dercetis*.

HABITAT.—Texas, July; Florida.

Types of both of the species are in the British Museum.

Family BREPHIDÆ.

Genus **BREPHOS** Ochs.

1816. Ochs., Schmett. Eur., IV, 96.

B. **infans** Mœschl.*

1862. Mœschl., Wien. Ent. Monatschr., VI, 134, pl. 1, f. 4, *Brephos*.
1865. Wlk., C. B. Mus., Het., XXXIII, 806, *Brephos*.
1867. G. & R., Trans. Am. Ent. Soc., I, 189, *Archiearis*.
1875. Speyer, Stett. Ent. Zeit., XXXVI, 171, *Brephos*.
1878. Lint., Ent. Cont., IV, 227, 229, *Brephos*.
1885. Dimmock, A. K., Psyche, IV, 273, *Brephos*.
1886. Snellen, Tijdschr. voor Entom., XXIX, 137, *Brephos*.
parthenias‡ Wlk.
1857. Wlk., C. B. Mus., Het., XVII, 841, *Archiearis*.
1860. Mœschl., Wien. Ent. Monatschr., IV, 371, *Brephos*.
1862. Mœschl., Wien. Ent. Monatschr., VI, 134, pr. syn.
hamadryas Harr.
1869. Harr., Ent. Corr., by Scudder, 174, pl. 1, f. 4, *Brephos*.
1867. Grt. & Rob., Trans. Am. Ent. Soc., I, 189, pr. syn.

HABITAT.—Labrador to New York in April; Canada in May.

Grote & Robinson's synonymic reference of Harris's species was made before the name was actually published.

B. **melanis** Bdv.

1868. Bdv., Lep. Cal., Ann. Soc. Ent. Belg., XII, 88, *Brephos*.

HABITAT.—California.

B. **californicus** Bdv.

1868. Bdv., Lep. Cal., Ann. Soc. Ent. Belg., XII, 88, *Brephos*.

HABITAT.—California.

I am not aware that the above species described by Boisduval have ever been definitely recognized or referred. It ought not to be difficult to ascertain what was intended when the material is at hand.

Genus LEUCOBREPHOS Grt.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 53.

L. brephoides Wlk.

1857. Wlk., C. B. Mus., Het., XI, 702, *Anarta*.
1864. Grt., Proc. Ent. Soc. Phil., III, 74, *Anarta*.
1867. G. & R., Trans. Am. Ent. Soc., I, 188, *Archiearis*.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 53, *Leucobrephos*.
1883. Grt., Can. Ent., XV, 55, *Leucobrephos*.
resoluta Zell.
1863. Zell., Stett. Ent. Zeit., XXIV, 136, pl. II, f. 1, *Archiearis*.
1867. G. & R., Trans. Am. Ent. Soc., I, 188, pr. syn.
1874. Grt., Bull. Buff. Soc. Nat. Sci., II, 63, pr. syn.
hoyi Grt.
1880. Grt., Bull. Bkln. Ent. Soc., III, 30, *Melicleptria*.
1883. Smith, Trans. Am. Ent. Soc., X, 251, *Melicleptria*.
1883. Grt., Can. Ent., XV, 55, pr. syn.

HABITAT.—Alaska; Hudson's Bay Territory; Wisconsin.

I have seen none of the types, and give the synonymy as I find it.

L. middendorfi Mén.

1859. Mén., in Schrenk's Reise, 66, pl. 5, f. 9, *Amphidasis*.
1883. Moeschl., Stett. Ent. Zeit., XLIV, 117, *Brephos*.

HABITAT.—Labrador.

I have seen specimens called *middendorfi* by Mœschler, but have not seen Siberian specimens to compare with them.

GENERAL INDEX.

[The object has been to refer to every name used in the body of the work. Family terms are in CAPITALS; generic names begin with a Capital in all cases, while species, varieties, and aberrations are always in lower-case type. Synonyms are in *italics*, and those of genera begin with a Capital. Specific and varietal names are indexed as often as they occur. Generic terms are referred to the page where the list of species begins, or, if a synonym, to the page containing the leading species.]

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